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ABSTRACT

This document presents best practice recommendations for important elements of environmental education including content, program development and implementation, assessment and evaluation, and professional development. Written for providers of environmental education, the guide is designed to help environmental education providers develop and implement the highest quality environmental education programs for all possible audiences. (YDS)

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BEST PRACTICES FOR ENVIRONMENTAL EDUCATION: GUIDELINES FOR SUCCESS

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A PROJECT OF

OHIO EE 2000: A STRATEGIC PLAN FOR ENVIRONMENTAL EDUCATION IN OHIO

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Ohio EE 2000

In 1996, the Environmental Education Council of Ohio (EECO) began a comprehensive process of planning for the future of environmental education in Ohio. EECO was joined in this process by other partners, including the Ohio Alliance for the Environment, the Ohio Department of Natural Resources, the Ohio Department of Education, the Ohio Environmental Protection Agency, the Ohio State University Extension, and the Science and Mathematics Network. The result was *Ohio EE 2000: A Strategic Plan for Environmental Education in Ohio*. The plan outlines a strategy for building Ohio's ability to promote reform-based environmental education that is interdisciplinary, community-based, and learner-centered.

Through support from the U.S. Environmental Protection Agency and the George Gund Foundation, implementation of Ohio EE 2000 is now underway. A Steering Committee oversees the work of Ohio EE 200, which is carried out by a project director, the Ohio Interagency Council on Environmental Education, and other committed volunteers around the state. *Best Practices for Environmental Education: Guidelines for Success* is one of the products of this work.

For more information contact: **Joyce Meredith, Project Director, P.O. Box 852, Hebron, Ohio 43025. Phone (740) 928-2576, Fax: (740) 928-4066, e-mail: downtoearth@voyager.net**

Environmental Education Council of Ohio (EECO)

EECO is a statewide professional organization dedicated to promoting environmental education which nurtures knowledge, attitudes, and behaviors that foster global stewardship. Teachers, naturalists, camp staff, youth leaders, university students, agency personnel and others join EECO to meet other environmental educators and to share ideas, resources, and teaching techniques. EECO sponsors statewide and regional conferences and workshops, distributes an informative quarterly newsletter and a biannual Green Paper, provides consulting services, serves as a liaison with other organizations concerned about environmental education, and gives annual awards recognizing outstanding achievements in the field of environmental education.

For more information contact: **Teresa Mourad, Executive Director, P.O. Box 2911, Akron, Ohio 44309-2911. Phone (330) 761-0855, Fax (330) 761-0856, e-mail: tmourad@theglobe.com**

Best Practices
for
Environmental Education:
Guidelines for Success

A project of

Ohio EE 2000: A Strategic Plan for Environmental Education In Ohio

Developed by:

Joyce Meredith
Project Director
Ohio EE 2000

Diane Cantrell
Ohio Department of Natural Resources and The Ohio State University Extension

Michael Conner
Nature's Classroom of the Ohio Conference, United Church of Christ

Bruce Evener
Whitehall City Schools

Diana Hunn
University of Dayton and Science Education Council of Ohio

Paul Spector
The Holden Arboretum

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Design and layout by:
Martha Filipic
Columbus, Ohio

Through its partnership with EECO, the Office of Environmental Education, Ohio Environmental Protection Agency, is pleased to make additional copies of this document available. Contact:

Office of Environmental Education
Ohio Environmental Protection Agency
P.O. Box 1049
Columbus, OH 43216-1049
(614) 644-2873
Fax: (614) 728-1275

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Core Work Group

Diane Cantrell, Ohio Department of Natural Resources and The Ohio State University Extension
Michael Conner, Nature's Classroom of the Ohio Conference, United Church of Christ
Bruce Evener, Whitehall City Schools
Diana Hunn, University of Dayton and Science Education Council of Ohio
Joyce Meredith, Ohio EE 2000
Paul Spector, The Holden Arboretum

Reviewers

Herb Broda, Ashland University
Sam Chestnut, Cuyahoga Valley Environmental Education Center
Dick Dieffenderfer, Ohio Department of Education
Rosanne Fortner, The Ohio State University
Sue Hennis, Tri-County Educational Service Center
John Hug, Environmental Education Consultant
Nancy King Smith, Nature Center at Shaker Lakes
Michelle Park, Ohio Parks and Recreation Association
Ron Reed, Mohican School in the Out-of-Doors
Ruth Wilson, Retired

Ohio EE 2000 Steering Committee

Patricia Barron, Science & Mathematics Network
Cecilia Franz Berg, Miami University
Bill Booth, COSI Toledo
Diane Cantrell, Ohio Department of Natural Resources and The Ohio State University Extension
Jim Carleton, PMI/Food Equipment Group
Michael Conner, Nature's Classroom of the Ohio Conference, United Church of Christ
David R. Greer, Danville High School and Knox SWCD Supervisor
Walter S. Handy, Cincinnati Health Department
Sheryl Hansen, Ohio Learning Network
John Hollback, American Electric Power
Don Kaufman, Miami University
The Hon. Sean Logan, Ohio House of Representatives
Michele Morrone (Chair), Ohio University
Gary Mullins, The Ohio State University
Irene Probasco, Ohio Alliance for the Environment
Stephen Sedam (Vice-Chair), National Audubon Society/Ohio
Paul Spector, The Holden Arboretum
Mary Steinmaus, Rural Action, Inc.
Carolyn Watkins (Secretary), Office of Environmental Education, Ohio Environmental Protection Agency
Deborah S. Yandala (Treasurer), Cuyahoga Valley Environmental Education Center and Environmental Education Council of Ohio

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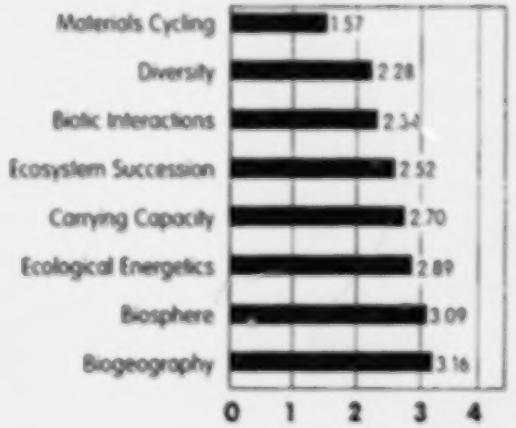
INTRODUCTION

WHAT IS "BEST PRACTICES FOR ENVIRONMENTAL EDUCATION," AND WHY DO WE NEED IT?

Environmental education is at a critical point in Ohio and nationwide. Knowledge about the environment and environmental issues among the general public is surprisingly low. *The 1999 National Report Card on Environmental Knowledge, Attitudes, and Behaviors* (NEETF/Roper Starch, 1999) gives Americans an "F" on their understanding of causes of basic environmental problems in the 21st century. Only one in nine scored 60 percent or above on a test of knowledge of issues likely to be a major problem in the next 15-25 years, and 1 in 25 scored 70 percent or above on an environmental knowledge quiz.

Here in Ohio, a study of adult environmental literacy found that Ohio adults demonstrate relatively good knowledge on four out of eight ecological principles, namely biogeography, the earth as a biosphere, ecological energetics, and carrying capacity (Mancl, Carr, & Morrone; 1999). However, the authors of this study recommend that attention be given to teaching Ohio adults about four other principles: ecosystem succession, biotic interactions, the importance of diversity, and, especially, materials cycling. Studies such as these demonstrate the need for quality environmental education efforts to enhance the environmental literacy of our citizens.

KNOWLEDGE SCORES (0 TO 4) OF PRINCIPLES OF ECOLOGY FOR 504 OHIO ADULTS



Mancl, Carr and Morrone, 1999

The public overwhelmingly supports environmental education in the public schools (NEETF/Roper Starch, 1997). De-

spite this public support for environmental teaching and learning, environmental education, or EE, is not without critics. In recent years, these critical voices have promoted the claim that EE uses scare tactics about impending environmental disaster to turn students into political activists. The book, *Facts Not Fear: A Parent's Guide to the Environment*, by Michael Sanera and Jane Shaw (1996), is perhaps the best known publication of this genre. In contrast, the North American Association for Environmental Education (NAAEE), the leading voice for the EE profession in North America, clearly affirms that good EE does not impose prescribed views or courses of action onto learners (NAAEE, 1996; 1999; 2000). Rather, good EE helps people learn how to evaluate information and points of view for themselves in order to make informed decisions. Despite this commitment to objectivity on the part of the EE profession, critics like Sanera and Shaw continue to find a listening ear for their criticisms of EE.

Ohio EE 2000: A Strategic Plan for Environmental Education in Ohio (EECO *et al.*, 1999) addresses the need for good environmental education that effectively and objectively helps learners develop into environmentally literate citizens while holding up against the charges of the most vocal critics. Growing out of this strategic plan, *Best Practices for Environmental Education* is a guide for the providers of EE – the people in the classrooms, nature centers, parks, zoos, museums, agencies, businesses, and organizations – who actually do EE. It is designed to help EE providers develop and implement the highest quality EE programs for all possible audiences.

Rather than a mandatory set of standards for EE practice, *Best Practices* is a tool for EE providers to use as they develop new EE programs, implement new or existing programs, or work to self-evaluate existing programs. Not every part of *Best Practices* will necessarily apply to every EE situation. As we will explore further, EE comes in many forms, and every EE program is unique. The developers of *Best Practices* have done their best to capture the wide spectrum of EE programs and audiences and to provide useful recommendations for as many as possible.

HOW WAS "BEST PRACTICES FOR ENVIRONMENTAL EDUCATION" DEVELOPED?

Best Practices for Environmental Education was developed as part of the implementation of *Ohio EE 2000: A Strategic Plan for Environmental Education in Ohio*. Action item 2.1 of this strategic plan calls for development of "guidelines for best practices in environmental education in Ohio that support lifelong learning" (EECO *et al.*, 1999). In an effort not to duplicate existing resources and guidelines, *Best Practices* was developed by reviewing, adapting, and incorporating relevant information from a wide variety of high-quality resources developed and endorsed at state and national levels. A list of references appears at the end of each chapter. For more depth on a particular topic, readers are encouraged to refer to the original resource documents.

HOW IS "BEST PRACTICES FOR ENVIRONMENTAL EDUCATION" ORGANIZED?

Best Practices for Environmental Education is organized into five chapters. Chapter 1 sets the stage with a description of the broad field of environmental education and the many audiences it reaches. Chapters 2 through 5 present best practice recommendations for important elements of environmental education practice: content, program development and implementation, assessment and evaluation, and professional development.

Chapter 1 Setting the Stage: What is *environmental* education, and who are the *learners* and the *educators*?

Chapter 2 Guidelines for Content: *What* is learned in EE?

Chapter 3 Guidelines for Program Development and Implementation: *How* is EE achieved?

Chapter 4 Guidelines for Assessment and Evaluation – How do we *assess learning* and *evaluate programs* in EE?

Chapter 5 Guidelines for Professional Development – How do we *become effective environmental educators*?

We encourage the readers of *Best Practices* to be flexible in their use of it. Explore topics relevant to your own programs, expand your knowledge in new areas, and make use of the references at the end of each chapter for more in-depth information. Use this resource guide as a tool to build your own success in environmental education!

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CHAPTER 1

SETTING THE STAGE: WHAT IS ENVIRONMENTAL EDUCATION, AND WHO ARE THE LEARNERS AND THE EDUCATORS?

WHAT DO WE MEAN BY ENVIRONMENTAL EDUCATION?

Put most simply, environmental education is education *in*, *about*, and *for* the environment (Lucas, 1972). Education *in* the environment helps people develop sensitivity to their surroundings and the natural world. Education *about* the environment promotes understanding of the natural, physical, and social systems that make up our environment. Education *for* the environment motivates people to work to improve the environment (Roth, Cantrell, & Bousquet, 1980).

Environmental education is not particularly easy to define. It may mean different things to different people. Scholars have posited various definitions through the years. *Ohio EE 2000: A Strategic Plan for Environmental Education in Ohio* offers this definition based on the shared ideas of those who collaborated on the plan:

> Environmental education is a process involving life-long learning as we come to understand the complexity of our natural world and environmental issues, using various approaches for individual and societal decision-making based on knowledge integrated from various disciplines, and resulting in our own attitudes and action strategies to "make a difference" in the world.
>
> EECO *et al.*, 1999

Regardless of the words we use, several core charac-

> *"I'm going home with a great feeling. I know the students had a great time. I did. Teaching appreciation of nature, each other, and respect of the environment is your strong point."*
>
> *—6th grade teacher experiencing residential EE program with learners*

teristics of EE, when taken together, help define EE as an endeavor:

- EE relates to an **environmental topic or issue**.
- EE is **interdisciplinary**, drawing upon many fields of study and learning.
- EE is **relevant** to the needs, interests, and motivations of the learner.
- EE is a **lifelong learning** process.
- EE is based on **accurate and factual** information.
- EE presents information in a **balanced and unbiased** manner.
- EE makes use of the **outdoors as a learning environment** whenever possible and appropriate.

WHO ARE THE LEARNERS AND EDUCATORS IN ENVIRONMENTAL EDUCATION?

"Know your audience" is a well-known piece of advice for anyone undertaking any type of communications effort. To provide high-quality EE, educators must understand the many contexts in which EE can occur and the diversity of learners it can reach. The intent of *Ohio EE 2000* is for EE to reach all Ohio citizens (a large and diverse audience, indeed!) which includes prekindergarten to twelfth grade learners, college and university (higher education) learners, and adult and general public learners.

Educators, especially environmental educators, often differentiate between *formal* and *nonformal* education. Mullins (1984) defines formal education as "a societally approved sanctioning system in which participants are required to learn and demonstrate certain competencies." In contrast, nonformal education features voluntary learning in which learners are not officially required to learn. Ham (1992) refers to formal and nonformal learners as "captive" and "noncaptive" audiences. The typical setting for formal education is the school or university classroom, although formal learning could take place on a field trip, in a hotel meeting room, or at a residential EE center. Nonformal educational settings include facilities like parks, zoos, and museums, although these sites may also be locations for formal educational activities as well. Here are some examples of formal and nonformal education:

Formal

- Public school classes.
- Courses, seminars, and workshops for certification or licensure.
- School groups attending residential EE centers as part of the school's curriculum.
- School field trips to parks, museums, or zoos.

Nonformal

- Recreational visits to parks, museums, zoos, and nature centers.
- Non-credit courses, seminars, and workshops.
- Summer camps for youth.
- Elderhostel programs.

Whether formal or nonformal, EE takes place in a wide variety of settings with a wide variety of learners. In Ohio, EE may occur in public and private schools, state and private

colleges and universities, parks, zoos, museums, nature and EE centers, soil and water conservation districts, governmental agencies, business and industry, environmental organizations, and community-based groups. In all of these cases, educators must consider both the **audience** and the **setting** in the design or implementation of any learning activity or program. With respect to the audience (learners), *developmental stages* and *learner motivations* should be given particular attention. For the learning setting, the *learning environment* itself and the *timeframe for learning* deserve special consideration.

Audience (Learners)

All educational programs should be appropriately designed for the developmental stages of the intended learners. *Best Practices* differentiates between **three broad developmental categories of learners:**

- Early childhood.
- Kindergarten through twelfth grade (K-12) and higher education.
- Adult/general public.

According to the Ohio Department of Education (2000), **early childhood** encompasses birth through third grade. This range of ages spans a multitude of developmental changes, and it is beyond the scope of *Best Practices* to make recommendations for each developmental stage within this range. Instead, these guidelines will provide broad, general recommendations for EE programs for young children, particularly those in the preschool/prekindergarten years.

As with early childhood, the **kindergarten through twelfth grade and higher education** category includes tremendous developmental differences. The recommendations and guidelines that follow encompass the broad category of K-12/higher education because most of the existing resources and guidelines reviewed in the development of *Best Practices* also utilize this categorization. For guidelines on more specific developmental stages, readers are referred to the original resource documents listed at the end of each chapter.

While **adult and general public audiences** are considered together, the general public category presents a unique challenge in that general public programs often serve learners in mixed age groups. Care must be taken to address the diverse developmental stages of the learners in these types of programs.

The **motivations of the learners** should be a primary consideration in the design and implementation of any educational program. While the topic of learner motivation is very complex, we may generally think of it as running along a continuum from *extrinsic* to *intrinsic*. Extrinsic motivation refers to external rewards or incentives to learn, such as grades,

certifications, diplomas, employment advancement, or even the approval of others. Formal education usually incorporates these types of extrinsic motivation. Intrinsic motivation is related to the internal interests or desires of the learner. Examples of intrinsic motivators include personal interests in a specific topic or activity, or a desire for personal growth or achievement. Intrinsic motivation is often associated with nonformal educational activities such as those that take place in parks, museums, zoos, nature centers, or even the media.

No matter where or how an EE program takes place, the educators must always ask, "What do the learners hope to get out of this program?"

Setting

The **educational setting**, which includes the learning environment and the timeframe for learning, is another important consideration in the design and implementation of EE programs. Learning can occur in all types of environments, but the best learning environments are those that are carefully chosen because they are compatible with the goals of the educational activity. Some activities may be best suited to traditional classroom or laboratory settings. Outdoor settings, effectively used, can help learners of all ages become more familiar with and sensitive to the natural world, and can unlock natural curiosity and appreciation of the environment. Special care may be needed, though, to help acclimate some learners to the outdoor world and to ensure safety and respect for natural resources during the course of EE activities held outdoors.

In addition to natural settings, the built environment can also be an excellent setting for environmental learning. For example, playgrounds, parking lots, water treatment plants, landfills, and industrial sites can effectively demonstrate relationships between human systems and the environment.

The **timeframe for learning** must be taken into account when planning an EE program. Formal educational activities take place over a wide range of timeframes, from part of a day to a full year. Some nonformal activities may only last for an hour or less. Educators must ensure that the goals and objectives of their programs are reasonable for the learning timeframe.

SUMMARY

Environmental education takes place in all types of settings with all types of learners. Educators must consider the developmental stages and the motivations of their intended learners and the educational setting when developing EE programs. The remaining chapters of *Best Practices* will provide background and recommendations related to important elements of EE practices for a wide variety of audiences and settings.

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CHAPTER 2

GUIDELINES FOR CONTENT: WHAT IS LEARNED IN EE?

According to the Environmental Education Council of Ohio (EECO), guidelines for content address "what is learned" by learners, how it is organized, and how it relates to learners. Content includes the knowledge, skills, attitudes, and behaviors that are the subject matter of EE programs, products, and services (EECO, 1996).

Knowledge emphasizes conceptual understanding of subject matter.

Skills include a full range of processes and abilities, higher level thinking, and communication skills that encourage lifelong learning.

Attitudes and values involve analysis and clarification of individual and group attitudes and values, rather than the acceptance of a particular set of attitudes and values.

Behavior refers to individual and collective actions that contribute to healthy and sustainable living in a global community, linking today's actions with future consequences. It includes an emphasis on the strategies that lead to responsible behavior and global stewardship.

At its best, EE content includes a balanced emphasis on all four of these "domains" of learning and reflects the core characteristics of EE first outlined in Chapter 1:

- **EE relates to an environmental topic or issue.** EE content should show clear connections to the environment or environmental concerns.
- **EE is interdisciplinary, drawing upon many fields of study and learning.** EE content should emphasize an integrated thematic, or interdisciplinary, approach where ideas are expressed through unifying themes and big ideas rather than isolated parts.
- **EE is relevant to the needs, interests, and motivations of the learner.**

> *"(I learned) many new concepts that can be used with diverse groups. I learned some things that I can use immediately."*
>
> *—Participant in an adult EE workshop*

EE content should relate learning to the real world. It should be personally relevant to the learners and encompass issues important to society.

- **EE is a lifelong learning process.** EE content should equip learners with the necessary skills to continue learning throughout life.
- **EE is based on accurate and factual information.** EE content should be based on accurate, reliable, and credible information.
- **EE presents information in a balanced and unbiased manner.** EE content should be balanced and unbiased, and should consider differing values and points of view.
- **EE makes use of the outdoors as a learning environment whenever possible and appropriate.** EE content should, when appropriate, emphasize knowledge of, comfort with, and sensitivity to the natural world.

> *"I really enjoyed Outdoor Education! It was a great experience for all the sixth graders. It is a great way to learn about plants, animals, and things we never heard about.... I wish I could come back again."*
>
> *—6th grader in a residential EE program*

The above are general guidelines that can be applied to any EE program for any audience. The following sections present specific content guidelines for three broad categories of learners: **early childhood, K-12 and higher education, and adult/general public.**

CONTENT GUIDELINES FOR EARLY CHILDHOOD

Well-known Ohio educator Dr. Ruth Wilson helped define the field of early childhood EE with her book, *Fostering a Sense of Wonder During the Early Childhood Years*. Wilson and her graduate students developed the content for this book by rigorously examining the philosophy, theory, and best practices of both early childhood education and environmental education. Wilson discovered parallels between the developmentally appropriate practices of early childhood education and the tenets of quality environmental education, concluding that "the integration of these two disciplines is both feasible and desirable" (Wilson, 1993, p. xii). *Fostering a Sense of Wonder* is the result of an integration of these two educational fields. The book was judged "outstanding" in a peer review process carried out by an outside evaluator for the Ohio Environmental Education Fund (Science and Mathematics Network of Central Ohio, 1995).

In *Fostering a Sense of Wonder*, Wilson stresses that EE can help young children understand themselves better as well as discover the world around them. She presents six goals, each with a set of related understandings, which may be used as content guidelines for early childhood EE. While early childhood is generally defined as birth through third grade (Ohio Department of Education, 2000), these goals and understandings are presented particularly for the prekindergarten/preschool audience, since guidelines for K-12 are presented later in *Best Practices*. The early childhood goals and related understandings, adapted from Wilson (1993, pp 10-11) are:

Goal 1: Develop an awareness and enjoyment of the beauty and wonder of the natural world.

Related Understandings:

- The natural world is full of beauty and wonder.
- Many works in art, music, and literature are based on different aspects of nature.
- The natural world can be a source of personal joy and inspiration.

Goal 2: Become aware of the concepts of cycles, diversity, and interconnectedness in nature.

Related Understandings:

- The natural world is in a state of constant change.
- Everything in nature is connected.
- All living things, including people, need food, air and water to survive.
- All the resources we use come from the natural world.
- Wildlife is found everywhere.
- Diversity is part of the natural environment.

Goal 3: Develop a sense of appreciation and respect for the integrity of the natural world.

Related Understandings:

- The natural world is ordered, balanced, and harmonious.
- Change is a natural part of the workings of the Earth.
- All living things and non-living things should be treated with respect.

Goal 4: Develop a sense of caring for Planet Earth and an understanding of how different types of pollution might harm the Earth.

Related Understandings:

- Earth is our home.
- It is important to relate to the natural environment in a respectful, caring way.
- There are many different types of pollution – noise pollution, visual pollution, air pollution, water pollution, etc.
- Pollution harms the natural environment and our enjoyment of it.

Goal 5: Develop an awareness that people are a part of the natural world, not separate from it.

Related Understandings:

- The health and well being of people are affected by the quality of the natural environment.
- The actions of individuals and groups affect other individuals, society, and the natural environment.

Goal 6: Develop an understanding of how to contribute to the well being of the Earth.

Related Understandings:

- We can reduce pollution through our personal actions.
- It is our responsibility to respect and take care of all aspects of the natural world.

These goals and related understandings reflect the developmental needs of young children to explore their surroundings in response to their natural curiosity and their "sense of wonder" about the world. In fact, according to Wilson (1993), the most important thing that young children can learn about the Earth is that it is full of beauty and wonder.

CONTENT GUIDELINES FOR K-12 AND HIGHER EDUCATION

As part of the National Project for Excellence in Environmental Education, the North American Association for Environmental Education (NAAEE) developed content guidelines for K-12 formal education. *Excellence in Environmental Education – Guidelines for Learning (K-12)* (NAAEE, 1999) presents content guidelines for each of three grade levels – fourth, eighth, and twelfth. (For specific grade level guidelines, please consult the full *Guidelines for Learning* document.) The guidelines correlate with major national standards and curriculum reform documents and are consistent with the Ohio model curricula and proficiency outcomes. They are organized into four strands, each representing a broad aspect of EE and the goal of environmental literacy. The developers of *Best Practices* recommend that the four content strands are also appropriate to higher education as well as K-12. The four strands are:

Strand 1: Questioning and Analysis Skills. Environmental literacy depends on learners' ability to ask questions, speculate, and hypothesize about the world around them; seek information; and develop answers to their questions. Learners must be familiar with inquiry, master fundamental skills for gathering and organizing information, and interpret and synthesize information to develop and communicate explanations. Specific skills in this strand are:

- Questioning.

- Designing investigations.
- Collecting information.
- Evaluating accuracy and reliability.
- Organizing information.
- Working with models and simulations.
- Developing explanations.

Strand 2: Knowledge of Environmental Processes and Systems. An important component of environmental literacy is understanding the processes and systems that comprise the environment, including human systems and influences. That understanding is based on knowledge synthesized from across traditional disciplines. The guidelines in this section are grouped in four sub-categories:

2.1 The Earth as a Physical System

- Processes that shape the Earth.
- Changes in matter.
- Energy.

2.2 The Living Environment

- Organisms, populations, and communities.
- Heredity and evolution.
- Systems and connections.
- Flow of matter and energy.

2.3 Humans and Their Societies

- Individuals and groups.
- Culture.
- Political and economic systems.
- Global connections.
- Change and conflict.

2.4 Environment and Society

- Human/environment interactions.
- Places.
- Resources.
- Technology.
- Environmental issues.

> *"Skills and knowledge are refined and applied in the context of environmental issues. These environmental issues are real-life dramas where differing viewpoints about environmental problems and their potential solutions are played out."*

Strand 3: Skills for Understanding and Addressing Environmental Issues. Skills and knowledge are refined and applied in the context of environmental issues. These environmental issues are real-life dramas where differing viewpoints about environmental prob-

lems and their potential solutions are played out. Environmental literacy includes the abilities to define, learn about, evaluate, and act on environmental issues. In this section, the guidelines are grouped in two sub-categories:

3.1 Skills for Analyzing and Investigating Environmental Issues

- Identifying and investigating issues.
- Sorting out the consequences of issues.
- Identifying and evaluating alternative solutions and courses of action.
- Working with flexibility, creativity, and openness.

3.2 Decision-Making and Citizenship Skills

- Forming and evaluating personal views.
- Evaluating the need for citizen action.
- Planning and taking action.
- Evaluating the results of actions.

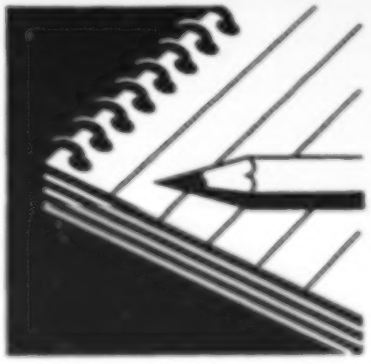
Strand 4: Personal and Civic Responsibility. Environmentally literate citizens are willing and able to act on their own conclusions about what should be done to ensure environmental quality. As learners develop and apply concept-based learning and skills for inquiry, analysis, and action, they also understand that what they do individually and in groups can make a difference. Specific skills in this strand are:

- Understanding societal values and principles.
- Recognizing citizens' rights and responsibilities.
- Recognizing efficacy.
- Accepting personal responsibility.

The four strands of the *Guidelines for Learning* demonstrate that the content of EE is much more than factual knowledge of ecological, scientific, or technical information. EE helps learners build important life skills and develop into responsible citizens. In other words, environmental education is *good* education.

CONTENT GUIDELINES FOR ADULT AND GENERAL PUBLIC LEARNERS

If early childhood, K-12, and higher education teaching and learning are successful, the result should be an environmentally literate citizenry. While a worthy goal, it may be unrealistic to expect all learners to achieve the same level of mastery upon completion of their formal education. Learners vary widely in ability level, interest, background, and many other factors, all of which influence their level of content mastery in educational activities. Learning should not end when formal schooling ends. Environmental learning is important at all stages of life, and EE should be a lifelong learning endeavor.



The goal of lifelong EE is environmental literacy for all citizens. Roth (1992) describes environmental literacy as a continuum of competencies, understanding, skills, and actions, rather than a discrete attribute that one either does or does not possess. He defines three points on this continuum, each of which is characterized by observable behaviors. Each successive point on the continuum represents an increased level of sophistication with respect to environmental learning and behavior.

The three levels of environmental literacy described by Roth can serve as useful content guidelines for various adult and general public audiences. The three levels of environmental literacy and their associated behaviors are:

Nominal environmental literacy. Learners who have achieved this level:

- Recognize basic terms used in communicating about the environment and can provide rough definitions of their meanings.
- Possess awareness and sensitivity towards the environment, respect for natural systems, and concern for nature and human impacts on the environment.
- Have rudimentary knowledge of natural systems and how human social systems interact with them.

Functional environmental literacy. Learners who have achieved this level:

- Possess a broader knowledge and understanding of interactions between human social systems and natural systems.
- Are aware of and concerned about negative interactions between human and natural systems in terms of one or more issues.
- Can analyze, synthesize, and evaluate information about issues using primary and secondary sources.
- Communicate findings and feelings to others.
- Demonstrate a motivation to work toward solutions to environmental problems by using basic strategies for social or technological change.

Operational environmental literacy. Learners who have achieved this level:

- Have moved beyond functional literacy in the breadth and depth of understanding and skills.
- Routinely evaluate impacts and consequences of actions.
- Gather and synthesize pertinent information, choose among alternatives, and advocate positions and actions that work to sustain or enhance a healthy environment.
- Demonstrate a strong, ongoing sense of investment in and responsibility for preventing or remediating environmental degradation.
- Act at several levels, from local to global, and routinely engage in dealing with the world at large.

Roth's (1992) three levels of environmental literacy can be a framework for leaders of adult learners to structure programs for different audiences and to help learners progress to higher levels of environmental sophistication throughout a lifetime of learning.

CHOOSING AND USING ENVIRONMENTAL EDUCATION MATERIALS

The content of EE programs is often determined by the use of preexisting curricula, activity guides, and other types of educational materials and media. A wide variety of sources produce large numbers of EE materials and make them available for educators to use in their programs. Project WILD, Project Learning Tree, and Project WET are but a few well-known examples of the many materials that have been developed. Unfortunately, not all EE materials are of the same level of quality. How can educators decide which materials to use in their programs?

As part of the National Project for Excellence in Environmental Education, the North American Association for Environmental Education (NAAEE) developed *Environmental Education Materials: Guidelines for Excellence* (NAAEE, 1996). These materials guidelines are designed to help those involved with providing EE to evaluate the quality of existing EE materials. *Guidelines for Excellence* outlines six key characteristics of high-quality EE materials and associated guidelines for each key characteristic. They can also be useful in helping learners build skills in critically evaluating materials.

A worksheet based on the *Guidelines for Excellence* is included in Appendix A. The worksheet can be used as a guide for evaluating EE materials for potential use in an EE program. The NAAEE has also developed an online workbook to accompany the *Guidelines*. The workbook presents activities and examples to help users better understand and use the *Guidelines* as a tool for evaluating EE materials. The workbook can be accessed at http://www.naaee.org/npeee/Workbook/.

SUMMARY

The content of environmental education is the knowledge, skills, attitudes, and behaviors that make up the subject matter of EE programs, products, and services. EE content relates to an environmental topic or issue. It is interdisciplinary, relevant for learners, and based on accurate information presented in an unbiased manner. EE content includes an emphasis on sensitivity to the natural world, as well as experiences with built environments. EE promotes the acquisition of life skills to help people become responsible citizens.

EE content for early childhood audiences focuses on providing sensory experiences to foster a sense of wonder with the natural world. For K-12 and higher education audiences, content includes questioning and analysis skills, knowledge of environmental processes and systems, skills for understanding and addressing environmental issues, and skills for

personal and civic responsibility. Specific content for these strands depends on the developmental stage of the learner. Readers are referred to NAAEE'S (1996) *Guidelines for Learning* for specific grade level guidelines.

EE content for adult and general public audiences can be guided by indicators for three progressive levels of environmental literacy: nominal, functional, and operational. Content can be focused to help adult learners progress to higher levels of literacy through a process of lifelong learning.

Content is the "what" of EE. The next chapter provides recommendations for bringing content to life through the process of program development and implementation.

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CHAPTER 3

GUIDELINES FOR PROGRAM DEVELOPMENT AND IMPLEMENTATION: HOW IS EE ACHIEVED?

In the last chapter, we considered the content (the what) of EE. We now turn our attention to the *how* of EE: program development and implementation.

Program development involves all the planning and related activities that must occur before learners are engaged in actual learning activities. In program development, goals and objectives are established, the specific content of the program is determined, educational materials are produced or selected, and the methods to be used in the teaching and learning process are planned. *Program implementation* begins when the learners actually engage in learning activities.

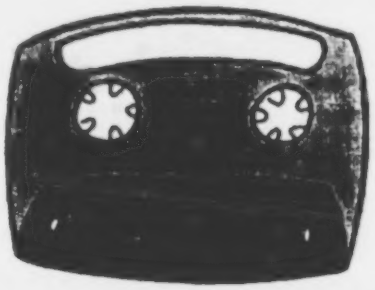
In some cases, program development and program implementation are two separate and distinct processes. Ideally, program development and implementation work together in a continuous process where learners are actively involved in planning and developing the program. Evaluation of the implemented program then provides guidance for how the program can be changed and improved (see Chapter 4).

A VARIETY OF PROGRAMS, PRODUCTS, AND SERVICES

A wide variety of EE program types can be developed and implemented for an equally wide variety of audiences or learners. As mentioned in Chapter 1, EE programs can be formal or nonformal, with either captive or noncaptive audiences (Ham, 1992). They may be provided or facilitated by a leader who is present during the learning activity, or they may take place without the physical presence of a leader. They may occur in classrooms, meeting rooms, museum galleries, outdoors, in front of a television, or virtually anywhere.

Examples of the forms EE programs and learning activities can take include:

- Teacher conducted classes.
- Lectures, workshops and seminars.
- Videos and slideshows.
- Exhibits and displays.
- Brochures, fact sheets, and newsletters.
- Public service announcements.
- Websites.
- Environmental interpretation programs.
- Learner designed investigations.
- Simulations and role plays.
- Interactive computer programs.
- Community service projects.
- Action research.
- Multiage teaching.
- Case studies.
- Group problem solving.
- Combinations of the above.



The procedures involved in program development and implementation will vary according to the type of program and intended audience. In most cases, guidelines for program development and those for program implementation are interchangeable, since that which is eventually implemented must first be planned and developed. The Environmental Education Council of Ohio (EECO) promotes guidelines for EE instructional processes which are generally applicable to program development and implementation for **nearly all program types and audiences.** These guidelines demonstrate that environmental education is *good* education: The methods and approaches used in environmental education embody the best of what we know about good teaching and learning, no matter what the subject matter.

EECO's guidelines (EECO, 1996) recommend that EE program development and implementation should:

- Recognize that learners build upon prior knowledge and experience **to construct their own knowledge** through investigations, discussions, applications, and other modes of active learning.
- Employ an exciting **hands-on, minds-on approach,** which includes physical involvement (where applicable), problem-solving, decision-making, reasoning, and creative thinking.
- Promote **learner-centered learning** where the learner is involved in all phases of learning from planning to assessment.

> *"You let the kids do a lot. I learned a lot of stuff in the classes...I got to see a lot of animals...the night hikes were the best."*
>
> *—6th grader in a residential EE program*

> *"It was helpful to learn the views of other leaders in my field, both professional and volunteer."*
>
> *—Participant in an adult EE workshop*

- Utilize leaders of learners as **facilitators, coaches, and mentors.**
- Encourage the use of **cooperative and collaborative learning** when learning occurs with groups of learners.
- Involve a mixture of **whole group, small group, and individual learning.**
- Encourage **multi-age** teaching and learning.
- Include a **variety of teaching and learning strategies.**
- Use a variety of **learning settings.**
- Accommodate multiple intelligences, different learning styles, and the developmental **needs of the whole person** (social, emotional, physical, mental, intellectual, aesthetic, and spiritual).
- Incorporate **assessment and evaluation** processes appropriate to the educational program or activity *(see Chapter 4)*.

We now turn our attention to program development and implementation for three broad categories of learners: early childhood, K-12 and higher education, and adult and general public audiences. Examples of exemplary programs from each category are also presented in boxes to illustrate how the guidelines can be put into real world practice. These exemplary programs were judged as "outstanding" in a peer review process carried out by an outside evaluator for the Ohio Environmental Education Fund (Science and Mathematics Network of Central Ohio, 1995).

PROGRAM DEVELOPMENT AND IMPLEMENTATION GUIDELINES FOR EARLY CHILDHOOD

As noted in Chapter 1, Ruth Wilson (1993), author of *Fostering A Sense of Wonder During the Early Childhood Years*, is one of the major pioneers in the area of early childhood environmental education. Wilson developed the following guidelines for developing and implementing an EE program for preschoolers (pp. 13-23). These guidelines are based on an understanding of how young children learn, and best practices for both early childhood education and EE.

- **Begin with simple experiences.** When introducing children to nature, start with the most immediate environment so that children feel safe and comfortable. Watch a bean sprout before tending a garden, or walk barefoot in the grass before wading in a stream.
- **Keep children actively involved.** Facilitate children's interactions with adults, materials, and their surroundings, allowing their interest, curiosity, and need to know to drive activities.
- **Provide pleasant, memorable experiences.** The enjoyment of an EE experience is just as important as the content.

- **Emphasize experience versus teaching.** For effective learning, young children need to be involved in sharing and doing versus listening and watching.
- **Involve full use of the senses.** Children need to engage with the natural world at the sensorimotor level.
- **Provide multimodal learning experiences.** Provide opportunities to learn through more than one avenue or channel of information.
- **Focus on relationships.** Promote cooperation, communication, and trust between people by encouraging cooperative learning in the outdoors. Help children feel comfortable in the natural environment in order to build independence and self-concept. Help children understand that all parts of the natural world are interconnected and that they are a part of it, as well.
- **Demonstrate a personal interest in and enjoyment of the natural world, and model caring for the natural environment.** Young children learn more about attitudes and values from their observations of adult behavior than they do from what adults say to them.
- **Maintain a warm, accepting, and nurturing atmosphere.** Young children need to know that they are valued and that they can trust the adults who work with them.
- **Introduce multicultural experiences and perspectives.** Use art, literature and visitors from different cultural backgrounds to introduce children to a variety of cultures.
- **Focus on the beauty and wonder of nature.** The most important thing young children can learn about the Earth is that it is full of beauty and wonder.
- **Go outside whenever possible.** If young children are to develop a sense of love and caring for the natural world, they must be given time to experience it.
- **Infuse EE into all aspects of an early childhood program.** EE should be integrated into all aspects of early childhood programs rather than being considered an "add on."

In addition to the above, Wilson suggests the following types of activities for implementing early childhood EE:

- Nature-related materials and activities in learning centers.
- Animals and plants as part of the classroom environment.
- Nature-related books for children.
- Nature-related art, music, and movement activities.
- Celebration of the four seasons with special nature-related activities.
- Using foods to show our connection to the natural world.
- Nature-related themes in group activities.
- Nature-related art and art projects made from materials

Exemplary EE Program:

Little Tikes Discovery Program

The Stark County School District implemented an early childhood EE program for preschoolers by creating three learning stations focusing on the five senses, animal life science, and earth science. Activities included art, music, dramatic play, and storytelling.

Strengths:

- *Good use of learning centers*
- *Focus on sensory learning*
- *Interdisciplinary, multimodal learning approach*

from the natural world.

- Field trips.
- Utilizing and developing the schoolyard to foster learning about wildlife and nature.
- Parent participation in nature-related activities.

Ruth Wilson's work in early childhood EE is an invaluable resource for educators working with young children. Another good source of information for early childhood EE is the *Earthworm* newsletter, published by the Early Childhood Outdoors (ECO) Institute, 1111 North Bellevue Blvd., Bellevue, NE 68005; (402) 453-5615, http://www.ecoinstitute.org.

PROGRAM DEVELOPMENT AND IMPLEMENTATION GUIDELINES FOR K-12 AND HIGHER EDUCATION

Methods for Incorporating EE into the Curriculum

Historically, the preferred method of incorporating EE into formal school curricula has been *infusion*, the incorporation of environmental concepts, activities, and examples into existing curricular goals (Monroe & Cappaert, 1994). Infusion has been seen as a way to put EE into the curriculum without teachers having to add "just one more thing to teach." Another method is *insertion*, where an environmental unit or course is added to the class or curriculum. Insertion usually means that something else is removed to make way for the new unit or course.

A well-accepted way to infuse EE in K-12 education is through the use of supplemental curricula. These consist of activity guides that provide lesson plans for learning activities aimed at various grade levels. Often the activities are correlated to a variety of subject matter areas so that they may be incorporated into all aspects of the curriculum. Project WILD (Western Regional Environmental Education Council, 1992), Project Learning Tree (American Forest Foundation, 1996), Project WET (The Watercourse and Council for Environmental Education, 1995), and Project Food, Land, and People (Project Food, Land, and People, 1998) are examples of some well-known supplemental curricula.

Engleson (1985, cited in Simmons, 1989) promotes infusion of EE into formal school curriculum by saying that "Environmental Education should permeate the entire curriculum with every subject area at every grade level dealing with the environment in some way. Some subject areas, by their very nature, present greater opportunities for infusion of environmental education, but all have a role to play." However, Simmons (1989) also says that, although the goal is to infuse EE into all subject areas, it is most commonly taught in science classes. This may be because preservice teachers are most often exposed to EE training in science methods classes, or because the major national supplemental curricula have the majority of their activities based in science.

Engleson (1989) provides an 8-step process for infusing EE into the school curriculum:

- Select the environmental topic to be infused into an existing subject area instructional unit.
- Identify the subject area units which relate to, or support, the investigation of the selected environmental topic.
- Develop one or more environmental objectives for the subject matter unit.
- Specify the environmental content to be added to the unit.
- Develop new instructional procedures as needed.
- Identify new process skills that might be used or developed in achieving the new environmental objectives.
- Identify new resources to be used in achieving the environmental objectives: equipment, consumable materials, references, field trip sites, resource people, etc.
- Identify related activities and new topics for investigation that may be suggested by teaching the newly infused unit.

Infusion and insertion are both viable methods for developing and implementing EE programs in formal education curricula. However, another approach, the *integrated* approach, is recommended by the major educational reform efforts of today and is consistent with the best of what we know about teaching and learning.

The Integrated Approach

Best Practices recommends an **integrated approach** to EE for formal K-12 and higher education. Integration operates under the philosophy that the world works holistically, without artificial boundaries, and may best be studied from the whole to the part, not the part to the whole (Cantrell and Barron, 1996). In an integrated approach, the boundaries between discrete disciplines of study are crossed or even eliminated. For example, rather than study Earth/space science concepts in one class, physical science in another, and life science in yet another, learners could learn concepts from all of these disciplines by focusing their study on a theme tying all of them together. The interdisciplinary nature of environmental topics and issues make it desirable, even necessary, to implement environmental teaching and learning through an integrated approach.

Integrated approaches to teaching and learning may include (Cantrell and Barron, 1996, p. 3):

- Multidisciplinary: Making connections across the boundaries of disciplines.

Exemplary EE Program:

Prairie Lincoln Big Darby Project

Students at Prairie Lincoln Elementary School in Franklin County studied the Big Darby Creek watershed through a combination of field trips and classroom activities. They learned why the watershed is important, what is has to offer the community, and ways of preserving and protecting it.

Strengths:

- *Integrated, interdisciplinary approach to learning*
- *Use of multiple learning settings and strategies*
- *Emphasis on environmental action skills*

Exemplary EE Program:

Why is Rush Creek Orange?

The Ohio Historical Society and Ohio Historical Foundation worked with students in first, third, fourth, eighth, ninth, and tenth grades in an investigation of "why is Rush Creek orange?" The students communicated with archaeologists, engineers, scientists, utility managers, wildlife experts, and zoo animal handlers through the use of teleconferencing, computer programs, and the internet to find answers to this question.

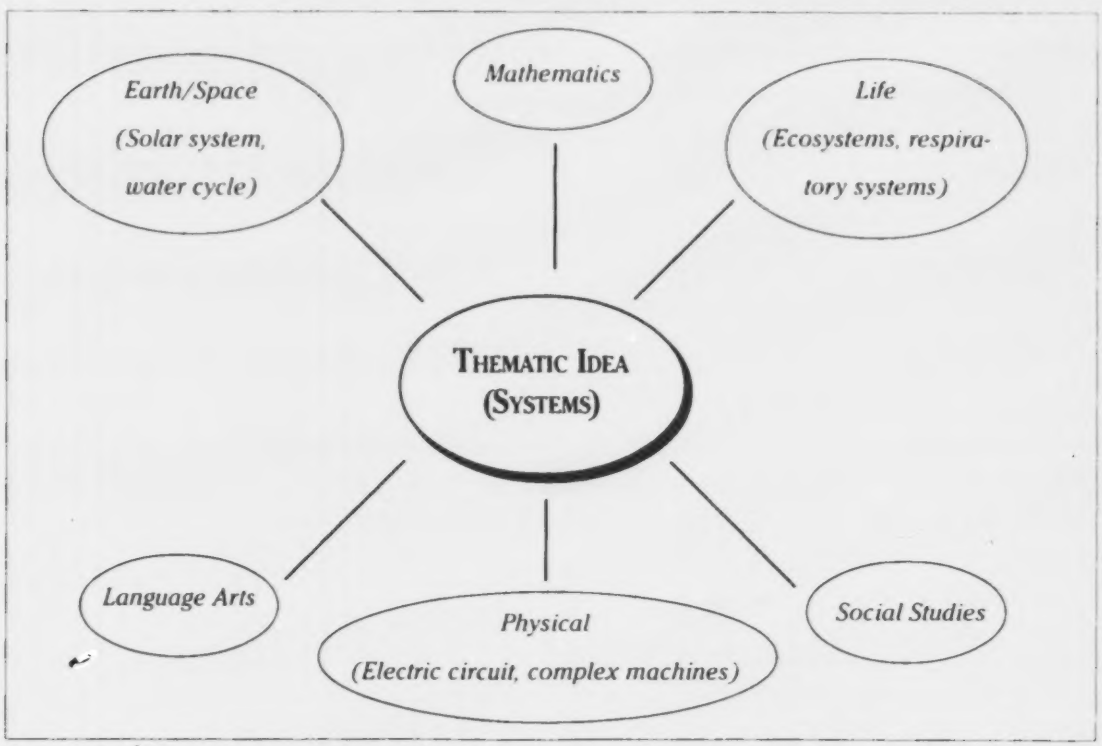
Strengths:

- *Emphasis on questioning and analysis skills*
- *Integrated, interdisciplinary approach*
- *Emphasis on communication skills*
- *Good use of outside experts as a resource*

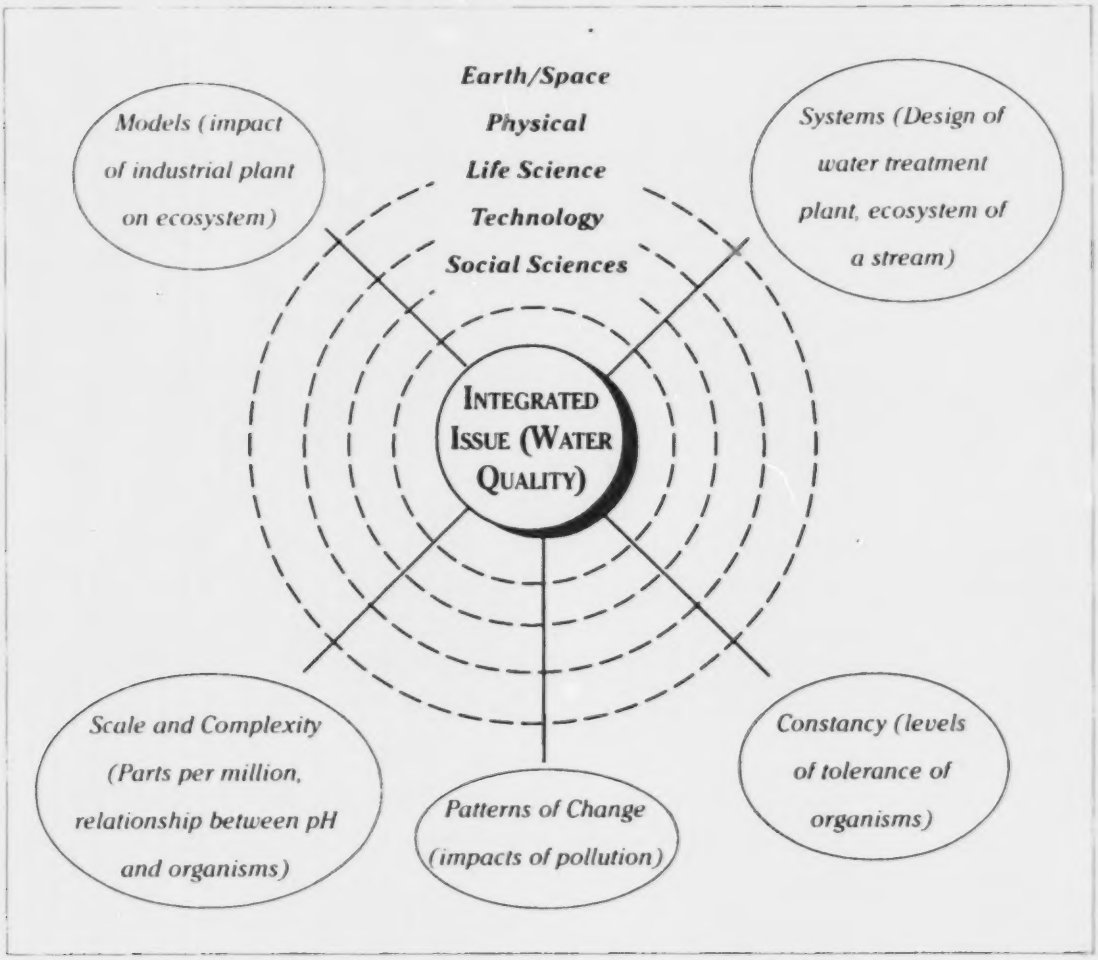
- Interdisciplinary: Blurring the boundaries among disciplines.
- Transdisciplinary: Eliminating the boundaries among disciplines.

An example of a **multidisciplinary** approach is to emphasize a single thematic idea and explore how concepts, principles, or topics from various disciplines exemplify the theme. Typically, only a few themes are addressed in a year-long study. See the diagram below for a model of the multi-disciplinary approach.

An **interdisciplinary** approach emphasizes an interdisciplinary issue or topic and investigates it through thematic ideas. It integrates disciplines of study and allows learners to make connections to



The multidisciplinary approach: Concepts, principles, and topics exemplify a single thematic idea.

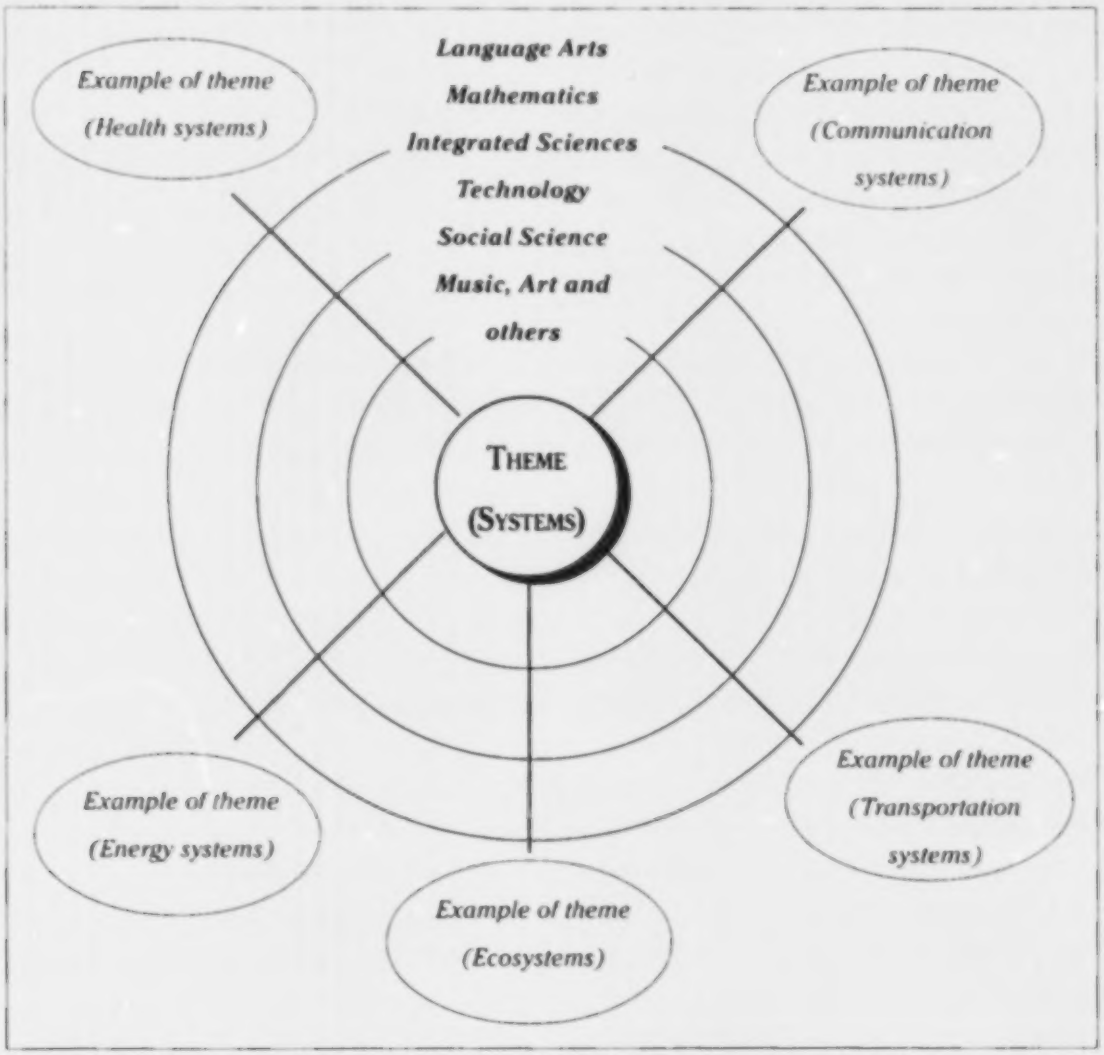

Earth/Space
Physical
Life Science
Technology
Social Sciences
Models (impact of industrial plant on ecosystem)
Systems (Design of water treatment plant, ecosystem of a stream)
INTEGRATED ISSUE (WATER QUALITY)
Scale and Complexity (Parts per million, relationship between pH and organisms)
Patterns of Change (impacts of pollution)
Constancy (levels of tolerance of organisms)

The interdisciplinary approach: Thematic ideas are used to investigate an interdisciplinary issue or topic.

real-life issues that are relevant to them. Because of their complexity, a limited number of these topics or issues would be explored each year.

In a **transdisciplinary** approach (see the following page), learners investigate broad areas of interest that exemplify a theme. They draw upon a mix of disciplines appropriate to studying the theme. Each year may focus on only one or a few themes.

The integrated approach to incorporating EE in formal education may best be exemplified by a newly developed concept known as **Environment as an Integrating Context (EIC).** EIC uses a school's surroundings and community – its environment – "as a comprehensive focus and framework for learning in all areas" (Lieberman and Hoody, 1998, overview). The "environment" in EIC spans a range of possibilities, including classrooms, playgrounds, fields and woodlands, off-site study areas, or a combination of settings. EIC allows learners to connect what they are learning in a variety of disciplines to their immediate surroundings.



The transdisciplinary approach: Learners investigate broad areas of interest that exemplify a theme.

EIC instruction takes many different forms depending on the school and community in which it takes place. However, researchers have found that successful EIC schools have these characteristics in common (Lieberman and Hoody, 1998, p. 10):

- Interdisciplinary integration of subject matter.
- Collaborative instruction (team teaching).
- Emphasis on problem solving and projects.
- Combinations of independent and cooperative learning.
- Learner-centered and constructivist approaches.

A recent research study of 40 United States schools using EIC, including two Ohio schools, suggests that the benefits of EIC go far beyond that of environmental learning.

The study provides evidence of increased academic performance, reduced disciplinary problems, and increased enthusiasm for learning (Lieberman and Hoody, 1998). The EIC approach clearly holds significant potential to enhance teaching and learning in formal education by using the environment as a focal point.

We have described a wide range of methods for developing and implementing EE in K-12 and higher education. While infusion is a widely used method, *Best Practices* and the field of EE in general recommend a greater emphasis on the integrated approach.

PROGRAM DEVELOPMENT AND IMPLEMENTATION GUIDELINES FOR ADULT AND GENERAL PUBLIC AUDIENCES

Adult and general public audiences are the targeted recipients of all types of EE programs. Adult learning theory, which represents the best knowledge of how adults learn, provides a basis for guidelines for this audience. The Science and Mathematics Network drew upon adult learning theory to develop a set of evaluation rubrics (see Chapter 4 for information on rubrics) to be used in the evaluation of adult and general public programs funded through the Ohio Environmental Education Fund. The following guidelines were adapted from these rubrics. They are divided into guidelines for **planning and design** of programs (program development) and guidelines for **audience experiences of programs** (implementation). The guidelines cover a wide range of audience experiences, or program types, that fall under the headings of courses, workshops, and seminars; media products; and print products.

Guidelines for Planning and Design

- Involve the **target audience** members or their peers in planning the content and format of the project or program, including planning and design, topic selection, and dissemination strategies.
- Build upon existing strategies in developing the topics and format used in the project or program, but include **innovative approaches** that will reach a broad audience.
- Where appropriate, design the program or project to **go beyond the transfer of information** to build comprehensive awareness, knowledge, and skills for making informed decisions and acting to solve environmental problems.
- Maintain **factual accuracy** and a **balance of viewpoints** throughout the program or project.
- Include a strong, multifaceted **dissemination strategy** for the program or project.

Exemplary EE Program:

The Master Conservationist Program

The Holmes County Soil and Water Conservation District conducted an extensive seminar over two consecutive summers to inform participants about the problems and solutions related to non-point pollution. The seminar employed a variety of learning strategies, and an action component encouraged participants to practice best conservation practices and to pass the information they gained onto others.

Strengths:

- *Use of innovative teaching strategies*
- *Strong action component*

Guidelines for Audience Experiences

1) Classes, Seminars, and Workshops

- Actively **engage** participants for at least half of the program.
- Include experiences that **go beyond traditional** lecture and audiovisuals, such as case studies, simulations, small group discussions, and field experiences.
- Where possible and appropriate, provide participants with several opportunities to choose from among a **variety of sessions or assignments** to best address their particular needs, issues, or questions.
- Divide learning materials and program sessions into **logical** segments and use them to reinforce and review information.

Exemplary EE Program:

Reuse Education Project

The Ultimate Recycling Center conducted a multifaceted public awareness campaign to enable and encourage residents of Southeastern Ohio to identify and divert reusable materials from the waste stream. Interactive workshops were conducted for schools, community groups, and businesses. Educational material was mailed to the general public, and three five-minute videos were produced describing how and why the public should identify reusable waste. The availability of a "reuse center" that could receive reusable items was key in allowing the educational process to culminate in an active response by participants.

Strengths:

- *Interactive workshops to keep participants actively engaged*
- *Use of multiple media types and a multifaceted dissemination strategy to reach a broad audience*
- *Emphasis on environmental action*

2) Media Products (video, audio, slideshows, multi-media, public service announcements)

- Ensure the product is effective in **gaining and maintaining attention,** including a motivating introduction and closing.
- Design the product to elicit an **interaction or response** by the intended audience and to encourage **further study or action** on the topic presented.
- Present key points in **sequential steps** and explain them **clearly** and without extraneous information.
- Use **high-quality visual and/or audio**, including special effects and, where applicable, an appealing, credible narrator.

3) Print Products (brochures, fact sheets, newsletters, exhibits, displays, websites)

- Write the **text clearly and engagingly.**
- Divide the material into **logically organized segments.**
- Make the **layout interesting and appealing.**
- Make effective use of many **visuals** (illustrations, photographs, maps, graphs and charts, etc.). These should be useful in communicating key points, clear, and easy to read or view.
- Design the overall product to be **easy to use** and, where appropriate, usable for different settings and situations.

Guidelines for Interpreting the Environment

Environmental interpretation is a somewhat unique category of activities that promote environmental learning. According to the National Association for Interpretation (NAI), "interpretation" is the term used to describe communication activities designed to improve understanding at parks, zoos, museums, nature centers, and aquaria. Interpretation includes all types of programs, products, and services, such as interpreter-led programs, exhibits, signs, media products, and brochures and other print products. Interpretation tends to be specific to the place at which it happens, and is an activity that people engage in during their leisure time. Often, people are just as interested in enjoying themselves as they are in learning something through interpretation. In fact, there has been some debate as to whether interpretation should be considered education or simply an activity unto itself. Regardless of how it is defined, environmental interpretation presents opportunities to foster environmental learning and stewardship.

Interpretation as it exists today was largely shaped by Freeman Tilden's 1957 book, *Interpreting Our Heritage*, in which he established six principles of interpretation:

- Interpretation should **relate** subject matter to something within the personality or experience of the visitor (learner).
- Information is not interpretation; interpretation is **revelation** based on information.
- Interpretation is an **art**. Any art is teachable to some degree.
- The chief aim of interpretation is not instruction, but **provocation**.
- Interpretation should present a **whole**, and should address itself to the **whole person.**
- Interpretation for **children** should follow a **different approach** than that for adults.

The National Park Service (NPS) now has in place an **Interpretive Development Program (IDP)** for the professional development of its interpreters. Developed with the input of hundreds of interpretive professionals throughout the NPS, the IDP outlines four tenets of the process of interpretation. The tenets focus on 1) the resource (that which is interpreted – i.e., the natural environment, natural features, heritage sites), 2) the role of visitors (learners), 3) the purpose of interpretation, and 4) the outcome of interpretation. These tenets summarize a best practices philosophy for the process of interpretation.

Tenet 1: The resource possesses meanings and has relevance. Each resource means different things to different people. Each resource acts as a focus for that which is meaningful to individual visitors.

Tenet 2: Visitors seek something of value for themselves. The visitor believes there is something worthwhile in the resource, but may or may not find value in it.

Tenet 3: Interpretation facilitates a connection between the interests of the visitor and the meanings of the resource.

- *Visitors are sovereign in what they believe and think.* They ultimately decide upon the

value of their experience and the value of the resource and its preservation. Interpreters must meet visitors on their own terms, and endeavor to move them to a greater appreciation and stewardship of the resource.

- *Meanings are more important than information.* The interpreter uses accurate information to help visitors find meanings in the resource and have significant life experiences during their visit.
- *Interpreters must be able to subordinate their own passion and understandings* of the resource so that visitors can form their own passion and understandings.

Tenet 4: The outcome of successful interpretation is an intellectual or emotional connection by the visitor with the meanings and significance of the resource. Such an outcome results in an increase in visitor care for the resource and support for its preservation.

One of the leading experts in the field of environmental interpretation is Sam Ham of the University of Idaho. Ham's book, *Environmental Interpretation: A Practical Guide for People with Big Ideas and Small Budgets* (1992), is widely regarded as a best practices manual for methods and techniques of environmental interpretation. Ham presents four qualities of effective interpretation:

Quality 1: Interpretation is *pleasurable*. Interpretation needs to be enjoyable, even entertaining, if it is to hold the attention of "noncaptive" (nonformal) audiences (see Chapter 1).

Quality 2: Interpretation is *relevant*. Being relevant means being meaningful and being personal. Information is meaningful when learners can connect it to something they already know. It is personal when it relates to something the learner cares about.

Quality 3: Interpretation is *organized*. Keep interpretive presentations organized around a manageable number of main points (five or fewer).

Quality 4: Interpretation has a *theme*. A theme is an easily understood message or big idea. Every interpretive presentation should be organized around a theme.

Most of Ham's book describes how to develop and implement a wide variety of interpretive programs, products, and services in a thematic way. Consult this valuable resource for more detailed information on developing and implementing interpretive programs.

INFRASTRUCTURE FOR EE PROGRAM DEVELOPMENT AND IMPLEMENTATION

The infrastructure of an environmental education program refers to the basic conditions necessary to develop and implement a program or activity. Administrative or institutional support, program leadership,

safety, accessibility, and liability are all elements of infrastructure that need to be addressed both before programs or activities are planned, and during implementation and evaluation. Recommended guidelines for infrastructure are:

Administrative or institutional support. EE programs should possess an administrative or institutional structure that has responsibility for:

- Hiring and retaining quality staff.
- Administering staff review and evaluation.
- Acquiring and maintaining adequate facilities, equipment, and other resources.
- Implementing key policies and procedures.
- Providing support for professional development and a quality work environment.

Program leadership. EE programs should have a person or persons responsible for overall program implementation. This person should:

- Have appropriate training in facilitating the program for which they are responsible.
- Have thorough knowledge of the site at which the program occurs and/or the organization which sponsors the program.
- Coordinate all aspects of program implementation, including, for example, applicable planning vehicles (lesson plans, program agendas), scheduling and logistics, and acquisition and allocation of supplies.

Safety. EE programs should have in place a system for ensuring safety, including:

- Written safety regulations that are clearly explained to program participants to address general safety concerns.
- Thorough knowledge on the part of program leaders of all issues surrounding safety and risk, such as applicable laws, codes, standards, and prudent practices.
- Advance provision of information to participants on clothing and supplies needed to participate in the program.
- Regular review of emergency procedures by program leaders.
- Training for leaders and participants in the safe use, disposal, and avoidance of hazardous or poisonous materials, chemicals, animals, or plants.
- Provision of adequate shelter for outdoor participants during inclement weather.

Accessibility. EE providers should:

- Make reasonable attempts to make programs accessible to persons with disabilities, or adapt programs so that persons with disabilities can participate fully without undue burden (see Appendix D).
- Strive to make programs accessible to participants of all economic backgrounds through various mechanisms such as grants, fundraising, and outreach programs.

Liability. EE providers should address issues of liability by:

- Implementing a plan for risk management to minimize risk to leaders and participants.
- Carrying adequate insurance for all program activities.
- Issuing appropriate warnings and disclaimers for activities that pose risks.

The Ohio Model Competency-Based Science Program, Appendix B (pp. 73-84), provides excellent information on safety equipment and other health and safety issues in education. Appendix C of the *Ohio Model* (pp. 85-88) lists applicable laws, codes, and standards from state and national entities and agencies. The document is available for downloading at http://schoolimprovement.ode.state.oh.us/downloads.html.

SPECIAL ISSUES FOR EE PROGRAM IMPLEMENTATION

As we have seen, EE encompasses a wide variety of program types and audiences. It is impossible to provide comprehensive guidelines for the development and implementation of all types of EE programs in one document. Consequently, some special issues related to the implementation of EE programs are discussed in appendices at the end of *Best Practices*.

In Chapter 1, we affirm that good EE makes use of the outdoors as a learning environment whenever possible and appropriate. Teaching outdoors requires careful planning, preparation, and execution in order to be successful. **Appendix B – Teaching Outdoors** presents strategies to help educators successfully use the outdoors as a learning environment.

Many adult and general public programs take the form of classes, seminars, and workshops. Because there are often no permanent facilities, staff, or other forms of infrastructure for these types of learning events, they usually require extensive logistical preparation and careful management in ways that formal education activities do not. **Appendix C – Management and Logistics for Workshops and Seminars** provides suggestions and a checklist for planning and managing these types of learning events.

Appendix D – Adapting EE Programs for Learners With Special Needs provides guidance in adapting EE programs so that they can be accessible to all learners to the fullest extent possible.

SUMMARY

Program development and implementation is the "how" of EE. Because of the wide variety of EE program types and the equally wide variety of audiences, providing guidelines for EE program development and implementation is a difficult task. We have presented different sets of guidelines for early childhood, K-12 and higher education, adult and general public, and audiences for environmental interpretation programs. Best practices in all of these categories include a learner-centered, hands-on approach featuring a variety of teaching and learning strategies.

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CHAPTER 4

GUIDELINES FOR ASSESSMENT AND EVALUATION: HOW DO WE ASSESS LEARNING AND EVALUATE PROGRAMS IN EE?

The content has been determined, the program has been developed, and implementation has begun. Now what? No EE program is complete without a well-planned, systematic procedure for assessment and/or evaluation. Assessment and evaluation answer the question, "how well are we doing?" Assessment and evaluation are performed to:

- Provide information on the strengths and weaknesses of programs.
- Give EE providers guidance in how to revise existing programs and develop new ones.
- Provide a means for accountability to the organizations who sponsor EE programs and the learners who engage in them.
- Make it possible for EE providers to retain and expand programs by demonstrating their effectiveness to sponsoring organizations, administrators, funding agencies, and policy setters.

For all sorts of reasons, assessment and evaluation are vital components of an EE program.

SOME DEFINITIONS

Assessment is "the process of gathering information about [learners] – what they know and can do" (Hart, 1994). Assessment answers the question, "what are the learners learning?" What knowledge, skills, attitudes and values, and behaviors are the *learners* acquiring as a result of participating in the program?

In contrast, **evaluation** answers the question, "is the *program* achieving its objectives, or is the program doing what we want it do to?"

In formal education (see Chapter 1 for a discussion of formal and nonformal education), educators assess what learners are learning, but evaluation gives meaning to that information. The meaning may come from determining if learners are learning what we *want* them to learn. Or, evaluation may answer the question, "are some learners learning more than others?"

Sometimes, as in some nonformal programs, learning is not assessed, but evaluation is done to determine if other types of objectives are being met. For instance, are we reaching the intended audience? How well is our program being attended?

Evaluation can be formative or summative (Jacobson, 1999). **Formative** evaluation takes place during the development and implementation of a program so that improvements can be made along the way. **Summative** evaluation takes place at the end of program implementation and provides information about the program's outcomes and impacts. Results from summative evaluations are often used to determine if a program will be continued or expanded.

Another type of evaluation is **front-end evaluation**, in which information is gathered about the needs and expectations of the target audience prior to program development (Serrell, 1996). This presents a good opportunity for program development to be a collaborative process between learners and program developers. The more program developers know about the intended audience before the planning and design phase, the more successful the program is likely to be.

GUIDELINES FOR ASSESSING LEARNING AND EVALUATING PROGRAMS

Below are guidelines, synthesized from several sources (see references), for assessing learning and evaluating programs in environmental education. They represent broad recommendations for best practices in assessment and evaluation. Methods for *performing* assessment and evaluation are discussed in later sections.

- EE providers should possess the **knowledge and commitment** to make assessment and/or evaluation an integral part of their EE programs.
- Program evaluation should be designed to determine if the stated **objectives** of the program are being or have been met.
- Providers should strive to **assess learning** whenever learning is a stated objective of the program.
- Whenever possible and appropriate, providers should utilize **authentic assessment** techniques as an integral part of program implementation to assess learning of essential knowledge, skills, attitudes, and behaviors.
- Whenever possible and appropriate, learners should be **active participants** in assessment and evaluation processes.
- Evaluation and assessment techniques used in a given program should be **compatible**

with the type of program and the learners involved, and should be **used to improve** program development and implementation.

- An outcome of evaluation and assessment should be to identify needs for **professional development** of staff (see Chapter 5).

METHODS FOR ASSESSING LEARNING

As described earlier, assessment determines what the learners are learning. Assessment is often a component of program evaluation. Environmental educators should attempt to build assessment of learning into their program evaluations whenever learning is a stated objective of the program. A variety of methods can be used to assess learning, as discussed below.

Authentic Assessment of Learning

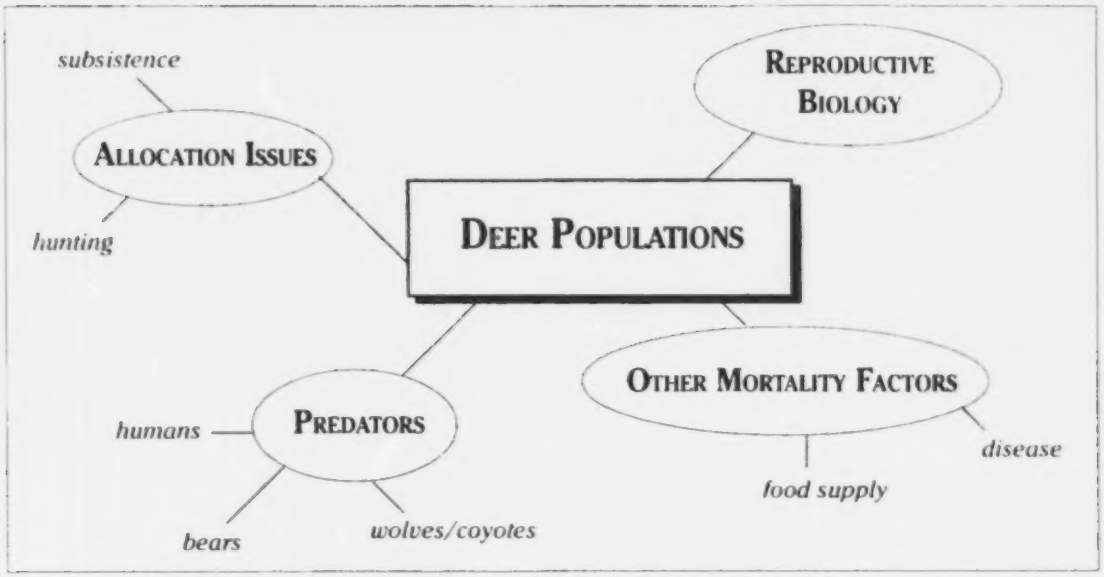
The use of authentic assessment techniques is highly recommended whenever learning is to be assessed. These techniques are especially suitable for formal education activities, but may also work well in many nonformal programs for children, adults, and general public audiences.

Authentic assessment involves learners in tasks that are **meaningful, worthwhile**, and make use of **higher order thinking skills** and **a broad range of knowledge** (Hart, 1994). This type of assessment is compatible with the kinds of learning promoted in EE. In fact, authentic assessment techniques can be used as learning tools in and of themselves. In authentic assessment, learners become active participants rather than passive test takers (Glencoe, 1994).

Authentic assessment can take many forms. Here are some examples:

- Most leaders instinctively use **observation of learner behavior** to gauge learner responses. But to be effective as an assessment tool, observation must be systematic, focused on learning goals, and well-documented (Hart, 1994). **Checklists** of behaviors or skills acquired can be used to keep a record of learners' acquisition of these behaviors and skills.
- Face-to-face **interviews** with individual learners may be recorded on interview sheets as a means of collecting in-depth information on learning.
- **Prior knowledge charts** ask learners to record what they *know* about a topic, what they *want* to know, and what they *learned* after the learning process. This technique enables educators to adapt learning activities according to what learners need and want to learn, as well as discovering what they do learn.
- **Concept maps** are graphical representations constructed by learners to show their understanding of relationships among ideas and concepts. An example of a concept map is shown on page 38.
- In **performance assessment,** learners are given a task and assessed on what they can do. For example, a learner might be asked to

> *"Authentic assessment techniques can be used as learning tools in and of themselves. In authentic assessment, learners become active participants rather than passive test takers."*



This "concept map" shows how learners could represent their understanding of concepts related to deer populations.

demonstrate the proper use of a water-testing kit. Or, a longer performance assessment might involve asking learners to outline a plan for investigating a local environmental problem.

- **Presentations** by learners are useful in that they allow the educator to hear what learners are thinking.
- **Projects and investigations** are effective ways to involve students in extended problem-solving or environmental action situations.
- A **portfolio** is a representative sample of the learner's work that is collected over time. Portfolios give a rich picture of the learner's knowledge, skills, values, and accomplishments. The long-term nature of portfolios make them particularly valuable in

Concept	No Evidence of Mastery	Some Evidence of Mastery	Effective Mastery Achieved
Habitat has four components: food, water, space, and shelter			
Habitat systems maintain their own system of checks and balances			
Natural disasters and human impacts can alter this natural balance			

A sample rubric, in which a pre-established set of criteria describes varying levels of performance.

documenting learner progress over time (Hart, 1994). They are also an excellent tool for helping learners assess their own progress.

In **scoring** authentic assessments, educators must specify criteria for judging performance in a systematic way ahead of time. One prominent means of achieving this is by use of **rubrics**. A rubric is a pre-established set of criteria with descriptors of varying levels of performance. The descriptors guide the evaluator in what to look for in a learner's work to determine their level of performance. An example of a rubric is shown on page 38.

For more information on authentic assessment, consult the references at the end of this chapter.

Traditional Assessment Techniques

Sometimes, such as in some nonformal programs, it is not possible or appropriate to use authentic assessment techniques. For example, in a public awareness campaign, learners engage in learning activities on their own time and at places of their own choosing. They may learn through a public service announcement heard over the car radio, a documentary on television in their home, or by reading print material almost anywhere. In cases like this learning may be assessed through more traditional "tests" in the form of questionnaires and surveys.

Traditional tests can be appropriate for some situations because they offer advantages that authentic assessment may not offer. Well-designed tests and survey instruments can yield numeric scores that can be compared between and across groups of learners. They can usually be used with large numbers of learners because they are less time-intensive to administer than authentic assessment tools.

Above all, EE providers must consider what types of assessment are possible and appropriate in light of program objectives, audiences involved, methods used in implementing the program, and available resources.

METHODS FOR PROGRAM EVALUATION

Evaluations can range from simple and short-term to full-scale comprehensive research projects. Many programs gather immediate *feedback* from participants to gauge their *satisfaction* with the program. Feedback questions may deal with things like quality of speakers, usefulness and clarity of information, and suggestions for improvement. Feedback provides insight into the strengths and weaknesses of a program and may suggest ways to improve the program. However, feedback usually does not constitute true evaluation, which is the process of determining if the stated objectives of the program are being or have been met.

In *Communication Skills for Conservation Professionals*, Jacobson (1999) describes three levels of program evaluation:

- **Level 1** evaluation simply measures the activities and products of the program. How many people were reached, sessions held, or brochures produced, for example. Did the program reach the intended audience? This level of evaluation generally does not include assessment of learning.
- **Level 2** evaluation measures whether the intended audience received, paid attention to, and retained the content of the program. Thus, some form of learning assessment must be part of this level of evaluation.
- **Level 3** evaluation goes beyond level 2 by seeking to measure changes in learner opinions, attitudes, or behaviors. As with level 2, level 3 evaluation involves assessment of learning.

Jacobson presents a variety of methods for evaluating programs. Depending on the objectives of the program and of the evaluation, these methods may or may not include assessment of learning. Often the best evaluations utilize a combination of more than one of these methods:

- **Questionnaires and surveys** conducted through the mail, by phone, or over the Internet.
- **Interviews** with participants (learners), staff, administrators, and other stakeholders.
- **Focus groups and group interviews.**
- **Observations** of participants, using checklists to tally specific behaviors, or field notes to record detailed information on behavior.
- **Numerical counts** of events, activities, programs, and participants.
- **Content analysis** of print materials.
- **Case studies** giving in-depth pictures of particular programs and their outcomes.

SUMMARY

Assessment is the process of determining what learners have learned as a result of an EE program. Evaluation is the process of determining if the program has achieved its stated objectives. Assessment should therefore be a component of evaluation in any program where learning is a stated objective. Other components of evaluation might measure how well objectives unrelated to learning are being met. Numeric counts of program activities or products would fall into this category.

Assessment and evaluation techniques used in a given program should be compatible with the type of program and the learners involved. The table on page 41 gives some examples of possible EE program objectives, and the types of evaluation that might be used to determine if they are being met. These are presented as suggestions to help EE providers choose evaluation methods appropriate to their own programs.

This table offers suggestions for evaluation strategies for various examples of program/learning objectives and learning activities. It is designed to offer "mix and match" options so that more than one activity could be used to support each example objective, and more than one evaluation strategy could be used to determine the success of each objective.

Examples of Program/Learning Objectives	Activities to Support Objectives	Possible Evaluation Strategies
For formal education teachers: • Improve classroom teacher knowledge of environmental problems & solutions • Increase integration of EE into the curriculum	• Provide classroom presentations by environmental professionals • Conduct teacher workshops and other professional development opportunities	• Interview or survey teachers to determine whether they have a better understanding of issues, and whether they have increased time spent on EE •Do a content analysis of lesson plans to determine the extent of EE integration
For formal education learners: • Increase learners' awareness, understanding, and/or knowledge of environmental topics and issues • Increase learner involvement in environmental action projects	• Provide classroom presentations by environmental professionals • Hold school festival on a local environmental issue • Establish hands-on EE programs and activities • Organize a school-sponsored environmental action project • Conduct an environmental field day	• Have learners keep a journal of their environmental projects • Create a school or community newsletter related to environmental issues • Have learners prepare and teach an EE lesson to other learners • Have learners design and produce a public service announcement, brochure, poster, or video on a local environmental issue • Have learners create a bulletin board, mural, or display in a public place to illustrate ways in which we all affect the environment
For adult/general public learners: • Increase community awareness of a local environmental problem or issue • Increase potential for environmental improvement through community involvement • Increase implementation of best management practices to improve environmental quality	• Hold community-wide festival on a local environmental issue • Write articles for local newspaper, encourage media coverage of local issues • Develop interactive display on local issues for use at fair, mall shows, community events • Coordinate community action projects such as stream clean-ups, tree planting, litter prevention initiatives • Establish community groups to work on environmental protection • Hold seminars for targeted groups (i.e. realtors, developers, construction companies, landowners, business and industry) • Develop promotional materials related to local environmental issues • Provide tours or farms, developments, businesses, that have successfully implemented best management practices	• Give learners a pretest and posttest to assess changes in knowledge and/or attitude • Survey general public before and after specific events • Hold focus groups to determine changes in understanding, attitude, and behavior • Describe new environmental protection plans or projects that have been developed • Interview community leaders to assess contacts they have had from their constituency on environmental issues • Monitor local newspapers for editorials on local environmental issues • Track numbers and types of requests for information and assistance on environmental issues • Track miles of stream cleaned, number of trees planted, and so on. • Interview or survey program participants before and after training events to assess changes in knowledge, attitudes, and behavior • Track the extent of best management practices implementation over several years

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CHAPTER 5

GUIDELINES FOR PROFESSIONAL DEVELOPMENT: HOW DO WE BECOME EFFECTIVE ENVIRONMENTAL EDUCATORS?

The term "professional development" describes the learning activities individuals engage in to prepare for their professional lives and to continue growing and maturing as professionals throughout their careers. Professional development is a critical factor to the career and success of environmental educators and to the effectiveness of EE programs. It is a lifelong learning process that should play a prominent role throughout the professional lives of environmental educators.

Professional development can be categorized as either preservice or inservice. **Preservice** professional development includes formal education, training, or other learning activities individuals engage in as they prepare to enter a chosen profession. **Inservice** professional development includes learning activities individuals engage in once they are practicing professionals. Guidelines for both preservice and inservice EE are presented in the following sections.

GUIDELINES FOR PRESERVICE PROFESSIONAL DEVELOPMENT IN EE

As part of the National Project for Excellence in Environmental Education, the North American Association for Environmental Education (NAAEE) produced *Guidelines for the Initial Preparation of Environmental Educators* (NAAEE, 2000). These guidelines (NAAEE, 2000, p. 1) present recommendations about the basic knowledge and abilities educators need to provide high-quality EE. They are designed to apply:

- Within the context of preservice teacher education programs and EE courses offered to students with varied backgrounds such as environmental studies, geography, lib-

eral studies, or natural resources.

- To the preparation of instructors who will work in both formal and nonformal educational settings, offering programs at the pre-K-12 levels.
- To those preparing to be full-time environmental educators and those for whom EE will be among other responsibilities or integrated within the curriculum.

The *Guidelines* are organized around six themes, each of which is recommended for the preservice training of an environmental educator. Below is a summary of the six themes and guidelines related to each one (NAAEE, 2000, pp. 5-6). For more detail, please consult the original *Guidelines* document listed in the references at the end of this chapter.

Theme #1 – Environmental Literacy. Educators must be competent in the skills and understandings outlined in *Excellence for Environmental Education – Guidelines for Learning (K-12)* (see Chapter 2):

- Questioning and analysis skills.
- Knowledge of environmental processes and systems.
- Skills for understanding and addressing environmental issues.
- Personal and civic responsibility.

Theme #2 – Foundations of Environmental Education. Educators must have a basic understanding of the goals, theory, practice, and history of the field of EE:

- Fundamental characteristics and goals of EE.
- How EE is implemented.
- The evolution of the field.

Theme #3 – Professional Responsibilities of the Environmental Educator. Educators must understand and accept the responsibilities associated with practicing EE:

- Exemplary EE practice.
- Emphasis on education, not advocacy.
- Ongoing learning and professional development.

Theme #4 – Planning and Implementing EE Programs. Educators must combine the fundamentals of high-quality education with the unique features of EE to design and implement effective instruction:

- Knowledge of learners.
- Knowledge of instructional methodologies.
- Planning for instruction.
- Knowledge of EE materials and resources.
- Technologies that assist learning.
- Settings for instruction.

- Curriculum planning.

Theme #5 – Fostering Learning. Educators must enable learners to engage in open inquiry and investigations, especially when considering environmental issues that are controversial and require students to seriously reflect on their own and others' perspectives:

- A climate for learning about and exploring the environment.
- An inclusive and collaborative learning environment.
- Flexible and responsive instruction.

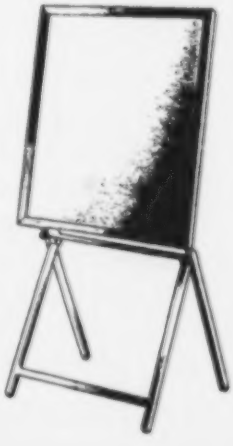
Theme #6 – Assessment and Evaluation. Environmental educators must possess the knowledge and commitment to make assessment and evaluation integral to instruction and programs:

- Learner outcomes.
- Assessment that is part of instruction.
- Improving instruction.

As reflected in these themes, professional development in EE fosters skills in exemplary EE program development and implementation (see Chapter 3). Constructivist approachs, learner-centered learning, cooperative and collaborative learning, varied teaching strategies and learning settings, and other characteristics of quality EE described in Chapter 3 are all qualities of good education in general. As such, EE can serve as a model for good teaching and learning in any discipline, and environmental educators can lead the way in exemplifying best practices for all educational processes.

GUIDELINES FOR INSERVICE PROFESSIONAL DEVELOPMENT IN EE

Just as EE is a lifelong learning process, professional development for environmental educators should be a career-long process. The following are guidelines for inservice professional development in EE:



- **Organizations** that provide EE programs should strive to **support and promote** professional development activities for their educators to the fullest extent possible.
- Practicing environmental educators should continually be exposed to the current state of and advances in the areas represented by the six themes outlined in *Guidelines for the Initial Preparation of Environmental Educators* (see above).
- Practicing environmental educators should continually be exposed to the current state of and advances in **safety practices and regulations** applicable to their particular learning setting.
- Environmental educators should work with their sponsoring organizations to develop **individualized plans** for professional development, and to continuously

Exemplary EE Program:

Enhancing Environmental Education Using Technology

The Science and Mathematics Network conducted a workshop for teams of teachers to explore how to integrate EE activities and computer technology into the curriculum. Teacher participants met with mentors who were environmental professionals from businesses and agencies to discuss technology applications in the work environment. Each team of teachers designed a set of learning activities that incorporated computer and online technology.

Strengths:

- *Emphasis on building new skills in planning and implementing EE programs*
- *Good use of mentoring*
- *Modeled exemplary teaching with collaborative, hands-on learning and participant projects*
- *Use of innovative teaching strategies*

evaluate and update these plans as needs and circumstances evolve.

- Educators and organizations should seek **creative ways** to provide for broad accessibility to professional development.
- Leader-led professional development activities should **model** the best of what we know about teaching and learning.
- Professional development should be a vehicle for the enhancement of **individual educators' skills**, and for improvement of the **larger organization**.

As noted above, professional development opportunities need to be accessible to all educators. Creative approaches to professional development can make this possible. Professional development can occur through a variety of avenues, including:

- Workshops and conferences.
- Graduate courses.
- Active participation in professional organizations.
- Distance and online learning.
- Peer study groups.
- Site visits to exemplary EE program sites.
- Mentoring programs.
- Observations of effective environmental educators.
- Professional certification programs.
- Professional reading and independent study.

GUIDELINES FOR THE PROFESSIONAL DEVELOPMENT OF ENVIRONMENTAL INTERPRETERS

The professional development guidelines presented so far are applicable to all forms of EE, including environmental interpretation. However, the Interpretive Development Program, a professional development program for interpreters employed by the National Park Service (see Chapter 3), provides a rigorous and comprehensive mechanism for professional development in the interpretive field. The program stresses the importance of developing a personal philosophy of interpretation to serve as a foundation for daily practice of the craft. It outlines ten core competencies for interpreters, which should be the content and skill focus of professional development programs in environmental interpretation. The core competencies are:

- Demonstrating successful informal visitor contacts.
- Preparing and presenting an effective interpretive talk.
- Preparing and presenting an effective conducted activity.
- Preparing and presenting an interpretive demonstration or other illustrated program.
- Effective interpretive writing.
- Developing/presenting a curriculum-based education program.
- Planning for interpretation.
- Developing interpretive media.
- Leading interpreters: training and coaching.
- Conducting interpretive research and working with resource specialists.

SUMMARY

Professional development for environmental educators is vital to maintaining high-quality EE programs and services. The *Best Practices* guidelines for professional development offer a framework for preparing future environmental educators through preservice professional development. Professional development continues beyond preservice preparation with inservice activities that should be a regular part of educators' professional lives throughout their careers. Through creative approaches, professional development can be accessible to all environmental educators.

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APPENDIX A

WORKSHEET FOR ENVIRONMENTAL EDUCATION MATERIALS: GUIDELINES FOR EXCELLENCE

As part of the National Project for Excellence in Environmental Education, the North American Association for Environmental Education (NAAEE) developed *Environmental Education Materials: Guidelines for Excellence*. These materials guidelines are designed to help those involved with providing EE to evaluate the quality of existing EE materials. They outline six key characteristics of high-quality EE materials and associated guidelines for each key characteristic.

As you work your way through the worksheet, use the following scale to rate each educational resource you are reviewing according to how well it meets the guidelines for each key characteristic:

5: Fully meets all of the guidelines for this key characteristic.
4: Meets most of the guidelines for this key characteristic well.
3: Meets some of the guidelines for this key characteristic to at least some degree.
2: Meets few guidelines for this key characteristic.
1: Meets none of the guidelines for this key characteristic.

As you evaluate your material in this holistic way, you might consider this scale from two dimensions. First, how many of the guidelines are met (e.g., 4 of 4, 3 of 4)? Second, for these guidelines, to what extent are they met? This combination will give you an overall rating. Place the score for each key characteristic on the line to the right of it.

To interpret your results, you may wish to consider your rating on individual key characteristics individually, depending on which are most important for the purposes of your program. Or, you may wish to compute an average score for the educational resource as a whole (see end of worksheet). Use the worksheet in the way that best meets the needs and objectives of your unique EE program.

Key characteristic #1 Fairness and accuracy: EE materials should be fair and accurate in describing environmental problems, issues, and conditions, and in reflecting the diversity of perspectives on them. _____

Guidelines:

1.1 *Factual accuracy:* EE materials should reflect sound theories and well-documented facts about subjects and issues.

1.2 *Balanced presentation of differing viewpoints and theories:* Where there are differences of opinion or competing scientific explanations, the range of perspectives should be presented in a balanced way.

1.3 *Openness to inquiry:* Materials should encourage learners to explore different perspectives

and form their own opinions.

1.4 *Reflection of diversity*: Different cultures, races, genders, social groups, ages, etc., are included with respect and equity.

Key characteristic #2 Depth: EE materials should foster awareness of the natural and built environment, an understanding of environmental concepts, conditions, and issues, and an awareness of the feelings, values, attitudes, and perceptions at the heart of environmental issues, as appropriate for different developmental levels.

Guidelines:

2.1 *Awareness*. Materials should acknowledge that feelings, experiences, and attitudes shape environmental perceptions and issues.

2.2 *Focus on concepts*. Rather than presenting a series of facts, materials should use unifying themes and important concepts.

2.3 *Concepts in context*. Environmental concepts should be set in a context that includes social and economic as well as ecological aspects.

2.4 *Attention to different scales*. Environmental issues should be explored using a variety of scales as appropriate, such as short to long time spans, localized to global effects, and local to international community levels.

Key characteristic #3 Emphasis on Skills Building: EE materials should build lifelong skills that enable learners to prevent and address environmental issues.

Guidelines:

3.1 *Critical and creative thinking*. Learners should be challenged to use and improve their critical thinking and creative skills.

3.2 *Applying skills to issues*. Students should learn to arrive at their own conclusions about what needs to be done based on thorough research and study, rather than being taught that a certain course of action is best.

3.3 *Action skills*. Learners should gain basic skills needed to participate in resolving environmental issues.

Key characteristic #4 Action Orientation: EE materials should promote civic responsibility, encouraging learners to use their knowledge, personal skills, and assessments of environmental issues as a basis for environmental problem-solving and action.

Guidelines:

4.1 *Sense of personal stake and responsibility*. Materials should encourage learners to examine the possible consequences of their behaviors on the environment and evaluate choices they can make that may help resolve environmental issues.

4.2 *Self-efficacy*. Materials should aim to strengthen learners' perception of their ability to influence the outcome of a situation.

Key characteristic #5 Instructional Soundness: EE materials should rely on instructional techniques that create an effective learning environment. _____

Guidelines:

5.1 *Learner-centered instruction.* When appropriate, learning should be based on learner interest and on the learner's ability to construct knowledge to gain conceptual understanding.

5.2 *Different ways of learning.* Materials should offer opportunities for different modes of teaching and learning.

5.3 *Connection to learners' everyday lives.* Materials should present information and ideas in a way that is relevant to learners.

5.4 *Expanded learning environment.* Learners should learn in environments that extend beyond the boundaries of the classroom.

5.5 *Interdisciplinary.* The materials should recognize the interdisciplinary nature of EE.

5.6 *Goals and objectives.* Goals and objectives for the materials should be clearly spelled out.

5.7 *Appropriateness for specific learning settings.* Claims about the material's appropriateness for the targeted developmental levels and the implementation of the activity should be consistent with the experience of educators.

5.8 *Assessment.* A variety of means for assessing learner progress should be included in the materials.

Key characteristic #6 Usability. EE materials should be well-designed and easy to use. _____

Guidelines:

6.1 *Clarity and logic.* The overall structure (purpose, direction, and logic of presentation) should be clear to educators and learners.

6.2 *Easy to use.* Materials should be inviting and easy to use.

6.3 *Long lived.* Materials should have a life span that extends beyond one use.

6.4 *Adaptable.* Materials should be adaptable to a range of learning situations.

6.5 *Accompanied by instruction and support.* Additional support and instruction should be provided to meet educators' needs.

6.6 *Make substantiated claims.* Materials should accomplish what they claim to accomplish.

6.7 *Fit with national, state, or local requirements.* EE materials should fit within national, state, or local standards or curricula.

To compute an average for this educational resource, enter your rating for each key characteristic below:

Key characteristic No. 1: _____
Key characteristic No. 2: _____
Key characteristic No. 3: _____
Key characteristic No. 4: _____
Key characteristic No. 5: _____
Key characteristic No. 6: _____

Total of above: _____

Total divided by 6 = _____

Appendix B

Teaching Outdoors

Learning in the outdoors will encourage learners to respect themselves and their natural environment. Skills that promote these understanding are developed by participating regularly in many outdoor activities. Whether learning the secrets of successful tree planting or the effects of water quality on organisms found in a stream, learners can become more engaged and successful through the use of hands-on experiences in the outdoors.

Several strategies can make outdoor learning experiences more rewarding for both the learner and the leader of the experience. The following strategies can help you as you explore the outdoors with learners.

Preparing the Activity

- In the beginning, choose the curriculum area that is your greatest strength to use as the basis for designing outdoor activities.
- Use an activity with a high percentage of success for learners. A variety of answers, diverse opinions, and different perspectives will generate a positive attitude.
- For the first several times that learners study outdoors, investigations that are short and focused are very effective.
- Use procedures and structures that learners are familiar with (recording data, grouping, using equipment, reporting, etc.).
- Be familiar with the collection laws in the area. The Department of Natural Resources or local extension service should have this information.
- Plan adequate time including going to and from the outdoor site (even if just outside the school building).

Preparing the Learners

- Understand that some learners may not have had outdoor learning opportunities and may be uncomfortable. Some misbehavior may be due to this discomfort.
- Give learners advance notice before going outdoors so that they may dress appropriately for that day (comfortable shoes, rain gear, jackets, etc.).
- Establish with the learners the objectives for learning outdoors.
- Before going outdoors, help the learners set appropriate guidelines for behavior.
- Select a partner or small group with which each learner must stay.
- Have learners gather and bring all necessary equipment.
- Set boundaries, time limits, and a place to meet.
- Agree upon a signal to call the group back together (raising a hand, setting time limits, clapping several times, making a bird call, etc.).

DOING THE ACTIVITY

- Introduce your activity and instructions appropriately and carefully. Choose the best spot. (You may be able to hold learners' attention better indoors.)
- Allow learners time to explore the activity area with the group before actually beginning their time in the activity. This will help ensure that the learners are focused.
- When addressing the whole group outside, have them seated comfortably (dry, looking away from the sun, not too hot/cold) and speak loudly.
- Respond to and encourage learner enthusiasm and curiosity. Share your own excitement whenever possible. Enjoy the outdoors with the learners!
- Understand that collecting plants or animals should only be done if necessary to observe over long periods of time.
- Model that all organisms are best observed in their natural environment without interference from observers.

FOLLOWING THE ACTIVITY

- Upon returning to the classroom, evaluate together the success of your outdoor experience (what worked, what didn't work and why).
- Brainstorm and/or initiate extensions to continue the lesson.
- Clean and store the equipment used.

TIPS FOR LEADING HIKES

Many EE programs, especially nonformal programs for adults and general public audiences, feature hikes in the out-of-doors. Here are some tips for managing group mechanics during natural history hikes.

- Before starting, **let the group know** where you will be going, how long it will take, and the relative difficulty of the walk.
- **Stay in the lead.** This helps you keep the group together rather than straying off trail.
- **Adjust the number of stops** to the size of the group. Larger groups usually take more time and require fewer stops.
- Attempt to **interact equally** with all members of the group, rather than just those at the front, for instance. Make sure to repeat questions or pertinent comments from group members so that everyone can hear them.
- Stay on time so that the hike ends when you said it would. If this is not possible, inform the group that you will be finishing late, and, if appropriate, give people the option to leave if they need to.
- **Establish a pace** that is comfortable for the slowest member of the group. If necessary, adjust the number of stops or the amount of time spent at each in order to stay on time.
- Stay aware of and monitor the **physical comfort** of the group frequently.
- If possible, **end the hike at the same place you started.** If this is not possible, make sure the group members know how to find their way to where they need to go.

The more time learners spend in outdoor activities, the more appropriate their responses will be to the out-of-doors. Start our simple, and take learners outside regularly. Watch as the learners grow in respect and understanding of the outdoors.

ADAPTED FROM:

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APPENDIX C

MANAGEMENT AND LOGISTICS FOR WORKSHOPS AND SEMINARS

Management and logistics for workshops and seminars can be routine as long as you follow a good checklist and begin on time. If you are a workshop organizer, your list will be much longer and involved and you will often have to begin even before the speakers are invited. Your last job is to prepare for the audience, literally, and then yourself, personally. *(Source: Garmston & Wellman)*

Prepare for the Audience -- what would *you* like to have ready when you show up for a program?

- Participants view (literally) — screen, equipment and speakers.
- Refreshments, paper, pencil, water, etc.
- Registration with greeter, name tags, sign-in sheet & handouts.
- Restrooms clean and well-marked.
- Displays or other special arrangements.
- Everything done at least 45 minutes in advance.

Prepare the Learning Environment — If your audience is comfortable, they can focus on the program's message better.

- Check room temperature.
- Provide for music, decorations, and lighting.
- Arrange seating for the room conditions and to meet learning objectives.
- Warm the stage with props, signage, etc.
- Decide the presenter's position in the room for maximum effect.
- Locate the correct type of podium.
- Test all AV equipment and set out visuals to be used first so they are ready when you are.
- Test sound system.
- Locate pointer and any other equipment in the place where presenters will use it first or can get to it easiest.
- Prepare handouts for distribution.
- Coordinate with moderator/assistant (human equipment).

Prepare the "Workspace"

- Organize entire workspace; remove items not needed.
- Be prepared for dark if using slides.
- Cut tape or get tacks ready for hanging easel paper.
- Designate a special place for supplies.
- Arrange space for transparencies.
- Make final notes to remember.

Personal Needs

- Careful what you eat or drink beforehand.
- Go to the bathroom.
- Look in the mirror.
- Give yourself a pep talk.

These things will make you feel better!

Logistics Checklist

- Indoor facility.
- Outdoor site.
- Workshop logistics.

The following three pages contain a worksheet and a room arrangement diagram that will help you more with the logistics of preparing for a program.

REFERENCES

ODNR Division of Soil and Water Conservation Environmental Education Section. 1997. Making more effective presentations, Participant Handbook. ODNR: Columbus, OH.

National Pork Producers Council. 1996. Environmental assurance technical presenters' guide (draft). Environmental Assurance Program NPPC: Des Moines, IA.

Garmston, R. J.; Wellman, B. M. 1992. How to make presentations that teach and transform. Association for Supervision and Curriculum Development: Alexandria, VA.

PROGRAM PLANNING AND LOGISTICS WORKSHEET

Responsibility	Status/Notes

Logistics Personnel

___ Has a logistics coordinator been identified?

___ Who is your contact at the off-site facility?

Facility Arrangements

___ Have you booked a facility?

Space Requirements

___ Is your main room big enough?

___ Is there enough room for meals? For refreshments?

___ Do you have/need space for a "logistics headquarters"?

___ Does the facility management know you will be taping or tacking flip charts sheets to their walls?

Equipment Requirements

___ Will lighting be bright enough?

___ Will acoustics and/or the sound system be adequate?

___ Have you arranged for equipment needed?

- ___ Audio-visual equipment with spare bulbs
- ___ Overhead, slide projector, video player, TV
- ___ Flip chart, easel, markers
- ___ Access to a copier and fax
- ___ Podium (size and location)
- ___ Microphone (Lavaliere, with cord or stationary)
- ___ Temporary storage
- ___ Extension cord, plug adapter, multi-plug strip

Setup Requirements

___ Have you communicated the room setup you desire with a floor plan drawing if necessary? (table, chairs, stage, etc.)

___ Tables for registration, supplies, teaching, exhibits, raffle/door prizes, etc. and their location

___ Restrooms (location, well-marked)

___ Arrangements for people with special needs (hearing, seating, etc.)

___ Eliminate or reduce distractions

___ Understand and/or get desired room ventilation and temperature

___ Establish smoking policy up front

___ Identify clear and well-marked emergency exits

___ Will tables be set and refreshed as needed?

- ___ Water
- ___ Tablets/pens/pencils

___ Do you have a mechanism arranged for getting messages to participants?

___ Can you get into your space with enough time to set up?

Responsibility	Status/Notes

Food Requirements

____ Are meals and refreshments arranged? (directions for delivery)

____ Special dietary requirements or preferences

Participant Needs

____ Have participants been identified?

____ Have invitations gone out to participants far enough in advance?

____ Has pre-work (if any) gone out to participants at the appropriate time?

____ Do participants have all the pre-meeting information they might need?

- ____ Map and directions to facility
- ____ Parking information
- ____ Overnight accommodations
- ____ Outdoor gear/supplies (boots, rain gear, bug repellent, etc.)

Speakers Needs

____ Map and directions, include specific room to go to & time

____ Help during presentation

____ Equipment or other special needs

____ Biography for proper introduction

Materials (Bring Extras)

____ Are the materials you will need ordered or do you have a plan to get them?

____ Participant manuals (one per participant)

____ Handouts (one per participant)

____ Supplies (tape, paper, markers, etc.) needed for special exercises

____ Name tags and tent cards (one per participant)

____ Program evaluations (one per participant)

____ Program registration sheet

Other Helpful Supplies

____ Scissors

____ Trash cans & bags

____ Lined and copier paper

____ Stapler and staples

____ "Post-it" notes

____ Index cards

____ Rubber bands, paper clips

____ Timer with a beeper

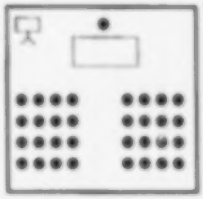
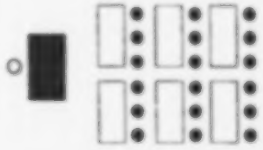
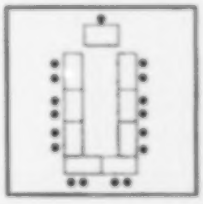
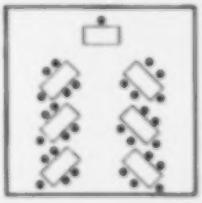
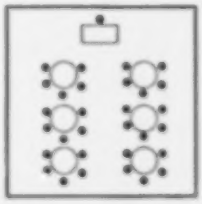
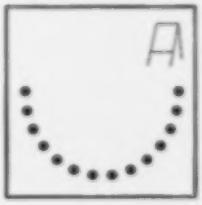
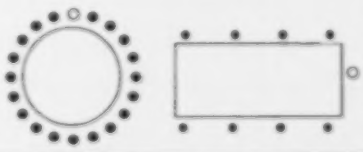
____ Clock

____ Ruler

____ Pen knife

(Source: NPPC)

ROOM ARRANGEMENTS

ARRANGEMENT DIAGRAM	PURPOSE	PEOPLE
	*Theater or auditorium style* offers the greatest number of seats in the smallest space but the lack of tables makes interaction and writing difficult.	50+
	*Classroom/Chevron style* adds tables and decreases space. It promotes presenter-audience discussion but inhibits group discussion. For lecture style learning and small-group discussions between people at the same or different tables angle the tables (Chevron style).	30-50
	*U-Shaped* seating allows participants to easily see each other, which promotes group dynamics. Authority is focused in the open end of the U.	15-30
	*Herringbone* seating is useful for small group discussions. It is less formal than classroom style.	30-150
	*Round or Buzz seating* is used when small group discussion is needed. Chairs arranged this way signal shared authority.	up to several hundred
	*Facilitating* is used for small groups where interactive discussion is shared and documented on easel or other visual.	10 or less
	*Conference* style is only for small groups where extensive discussion is needed and group will be writing and reading.	10 or less

Source: Garmston and Wellman

APPENDIX D

ADAPTING EE ACTIVITIES FOR LEARNERS WITH SPECIAL NEEDS

GENERAL GUIDELINES

Sometimes when educators adapt activities to meet the special needs of their learners, the objective of the original activity gets "lost" in the process. The following guidelines are intended to help you avoid this pitfall:

- Adhere to the *original objectives* of each activity.
- Try to conduct the activity as originally written as much as possible.
- Attempt to conduct each step in the activity. Try to adapt steps that present difficulties rather than leaving them out.

In the "real world" you may not always want to or need to conduct every step of an activity. Just remember that you are making modifications in order to make the activity accessible to your learners, not modifying the objectives of the activity.

ADAPTING ACTIVITIES FOR INCLUSIVE SETTINGS

When adapting activities for inclusive settings remember that each individual is unique. It is important for educators to recognize each individual's unique needs. When conducting activities, be aware of safety considerations. All learners should be aware of environmental factors and specific modifications. In general:

Prepare participants without disabilities by giving them:

- General information about disability issues.
- Specific information related to the needs of participants with disabilities.
- The opportunity to role-play — have all learners "try out" the disability.
- Guidelines—discuss the role of all participants, those with and without disabilities, to increase participation of all.

Include participants with and without disabilities in the decision-making process regarding adaptations, rules, and other changes:

- The participant with a disability knows his or her abilities better than anyone else.
- Non-disabled peers feel included by helping to make decisions about modifications.
- Activities may be more successful because all participants were involved in initial adaptation decisions.

FACTORS TO CONSIDER WHEN ADAPTING ACTIVITIES

When approaching the idea of adapting activities, it is helpful to identify the factors that you need to consider

to enable learners to participate as much as possible in each activity. The worksheet at the end of this appendix is designed to help you prepare for an environmental education activity that includes learners with and without disabilities. It is intended to help facilitate a process of evaluating the abilities and needs of learners in relation to an activity or specific lesson plan. There are nine main factors that need to be considered when adapting activities. The following sections provide a description for each factor.

ABILITY LEVELS AND FUNCTIONAL IMPAIRMENT

A learner may have more than one functional impairment. An impairment may refer to more than one type of disability. For example, a person with cerebral palsy and a person with a brain injury may both have difficulty with balance. There are 14 major areas of functional impairments. These include:

- Activities of Daily Living: The normal day-to-day activities that everyone needs to do to function including eating, dressing, toileting, and personal hygiene.
- Balance: The ability to hold oneself upright while walking, standing, sitting, or moving around.
- Circulation: The body's ability to maintain the needed blood flow for optimum physical condition.
- Sensation: The ability to detect through the sense of touch what is or is not touching or affecting the body in some way.
- Motor Control: The ability to use muscles.
- Fatigue: The ability to maintain the energy level necessary to perform the daily routine of life.
- Diet: The body's needs with regard to the intake of nourishment in order to maintain a healthy physical condition.
- Judgment: The ability to make judgments on personal matters regarding behavior and choices.
- Memory: The ability to retain and recall pertinent information when needed.
- Reasoning: The ability to think critically, comprehend information, and problem-solve.
- Communication/Language: The ability to communicate and comprehend information.
- Behavior: The ability to behave and express emotions appropriately for the situation.
- Hearing: The ability to hear sounds necessary to function in everyday life. Impairment could include partial hearing loss.
- Vision: The ability to see what is necessary to function in everyday life. Impairment could include partial vision loss.

PRESENTATION METHODS

Some changes may be necessary in presenting the activity, e.g., visual, auditory, or tactile. For example, if you're planning to collect leaves, show examples of real leaves, in addition to talking about the leaves. Allow learners, especially those with visual impairments, to touch and feel the leaves to compare characteristics.

- Model as much as possible by showing visually what learners should do, in addition to explaining orally. Concepts may need to be modeled. For example, as part of a predator/prey activity, the prey would move closer for each round of the game. The concept of "moving closer" should be modeled before the activity begins.
- Use peers to assist each other — pair lower functioning learners with higher functioning peers; nonreaders

with readers; non-writers with writers, etc.

- Repeat directions/rules often — repetition is important for learners with developmental disabilities.
- Use a hands-on, sensory approach.
- Include objects or actual items for tactile effectiveness.
- Use sound when possible. For example, if conducting an activity about water, play a tape of rain, thunderstorms, and river sounds.
- Incorporate sign language (if possible) for learners who are deaf.
- Brainstorm to generate group discussions — good for auditory learners.
- Use prompting questions to help learners focus on the activity.
- Have participants sit (or stand) in a circle to help facilitate whole-group discussion.

LEAD-UP ACTIVITIES

Certain activities may be useful to help prepare learners before presenting the activity. For example, before making a bark rubbing outside, have learners practice how to hold the crayons and paper by having them make a rubbing of a textured object such as a coin or leaf. Assist by physically manipulating their hands through the motion, if necessary.

- Conduct lead-up activities that relate to the concept or to the rules of the main activity. This can include reading stories/books, discussing rules for being outside, practicing how to collect objects, etc.
- When conducting art projects, model how to cut neatly, how much glue to use, how to color neatly.
- Show the learners pictures of animals or plants they may see during the activity.
- Show a video to get ready for the activity.
- When working with more than one group of learners, conduct "getting acquainted" activities to promote positive group interaction.

PHYSICAL ENVIRONMENT

The physical environment for the activity may present a challenge to some learners. Is a more accessible site needed? What changes need to be made within the existing site?

- The setting may need to be altered to accommodate wheelchair users, or learners who have trouble walking and participants with balance problems. Note: You can still conduct active games and maneuvers with learners who use wheelchairs.
- Try to use terrain that is flat and smooth, as opposed to hilly and bumpy.
- Make sure space is large enough to accommodate a group of wheelchair users.

MATERIAL ADAPTATIONS

Materials used for the activity may need to be changed or adapted.

- Allow for variations in the types of objects used for learners with poor fine motor skills. Use items that are easier to grab and hold. For example, poker chips are easier to pick up than pieces of paper.

- Make a chart of new terms (vocabulary) for visual learners.
- In addition to using pictures of objects, have the actual objects available to touch, smell, see, hear.
- When using written directions in an activity, use words and pictures to accommodate non- or low-level readers.
- For projects that involve scissors, pre-cut patterns/shapes in advance.
- Use objects that can be picked up easily. Avoid those that lie flat; provide objects that can be easily handled.

PROCEDURAL/RULE ADAPTATIONS

Some procedures may need to be changed when conducting the activity.

- Try to engage all learners as actively as possible. Assign roles so that all are involved and everyone has something specific to do — be directive.
- When collecting data and recording observations, instead of having the participants write or record individually, have them make observations orally and record as a group onto one chart (good technique for non-writers, and learners with limited fine motor skills).
- Allow more time for collecting, for hiding, for counting, etc.
- Have enough helpers around to assist learners with ambulatory needs, such as pushing chairs, helping to walk, helping to see. These can be peer helpers or adults.
- When manipulating objects, have the learners work in pairs or small groups of mixed ability levels. One person can move the object while the others observe. Learners who cannot move their arms or hands may be able to manipulate objects with their chins, or "point" with their eyes.
- Have learners use a partner for recording information or use a tape recorder.
- Have learners focus on describing textures instead of trying to name objects.
- Give simple directions.
- When collecting, set rules about objects to collect, such as no living animals.
- Use peers to assist with gathering; use word or picture cards and have learners collect that exact item for matching.
- Increase time limits for each round of an activity.
- Use partners with learners who are visually impaired.
- For active games, assign roles to "equalize" participation, i.e. learners who can run have to hop; blindfold the quick learners, no one can move faster than a walking pace.
- Set ground rules for safety. Make sure learners understand safety precautions.
- Limit the amount of new vocabulary and terminology to key concepts. For example, if the activity focuses on the parts of a tree, you may want to concentrate on "bark," "roots," and "leaves" and their importance.

BREAK ACTIVITY INTO TASKS

Allow enough time for completion and comprehension of the activity.

- Take your time conducting an activity—use specific blocks of time for each task. For example, if the activity usually consists of three steps conducted for 50 minutes, pick one or two of the steps to conduct during this time; complete the remaining step during another time block.
- Teach one concept at a time using a hands-on approach—short blocks of time work best (20-30 minutes) for

each concept.

- Repeat and review often all previous steps.

EVALUATING THE ACTIVITY

Assessment/evaluation strategies listed for the original activity may need to be changed or adapted.

- Rather than focusing on cognitive gains, evaluation may need to focus on the ability of participants to:
  - Complete a task.
  - Follow rules and directions.
  - Work together.
  - Socialize in an appropriate manner.
  - Be actively engaged in the activity.
- Discussion can be used to assess knowledge.
- If administering a formal test, read test questions to learners with visual learning problems, or to learners who are interested in being tested auditorily.

EXTENSIONS

What follow-up activities will you use for this activity and how will you make the extension accessible for all participants?

- When planning follow-up activities consider the adaptations discussed for presentation methods, the physical environment, materials, procedural and rule adaptations, breaking the activity into tasks, and evaluation.

ADAPTED FROM:

Ricker, K. T., Freeman, G. J., and Hoy, D. R. 1996. Unlimited Classrooms: A Resource Guide for Inclusive Environmental Education. Ashley, OH: Recreation Unlimited.

Note: Ricker, Freeman, and Hoy cite the following source for much of the information utilized here: Celebrate the Earth: An Environmental Education Curriculum for People with Varying Abilities. 1993. Vinland Center, Loretto, Minn.; developed in conjunction with Wilderness Inquiry. For more information contact the Vinland Center, Box 308, Loretto, MN 55357; (612) 479-3555.

WORKSHEET FOR ADAPTING EE ACTIVITIES FOR LEARNERS WITH SPECIAL NEEDS

Activity: _____

Date(s) Conducted: _____

Place Conducted: _____

Ability Levels and Functional Impairments (What needs to be considered when planning this activity? Enter each learner's name on the appropriate lines below.)

Activities of daily living _____

Balance _____

Circulation _____

Sensation _____

Motor control _____

Fatigue _____

Diet _____

Judgment _____

Memory _____

Reasoning _____

Communication/Language _____

Behavior _____

Hearing _____

Vision _____

Other _____

Presentation Methods (What changes should be made in presenting the activity, e.g. visual, auditory, or tactile?)

Lead-up Activities (What activities would be useful before presenting this activity?)

Physical Environment (What changes are necessary for conducting this activity? Is a more accessible site needed?)

Material Adaptations (What changes are needed for the materials used in this activity?)

Procedural/Rule Adaptations (What procedures need to be changed when conducting this activity?)

Break Activity into Tasks (How will you organize this activity to allow time for completion and comprehension?)

Evaluating the Activity (What changes will you make to the assessment/evaluation strategies suggested by the publishers?)

Extensions (What follow-up activities will you use for this activity and how will you make the extension accessible for all participants?)

Other Comments (Make note of any problems you had when adapting this activity.)

SE030004

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